The PHOTOFACT Servicer

SET 424 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ DEC. 15, 1958

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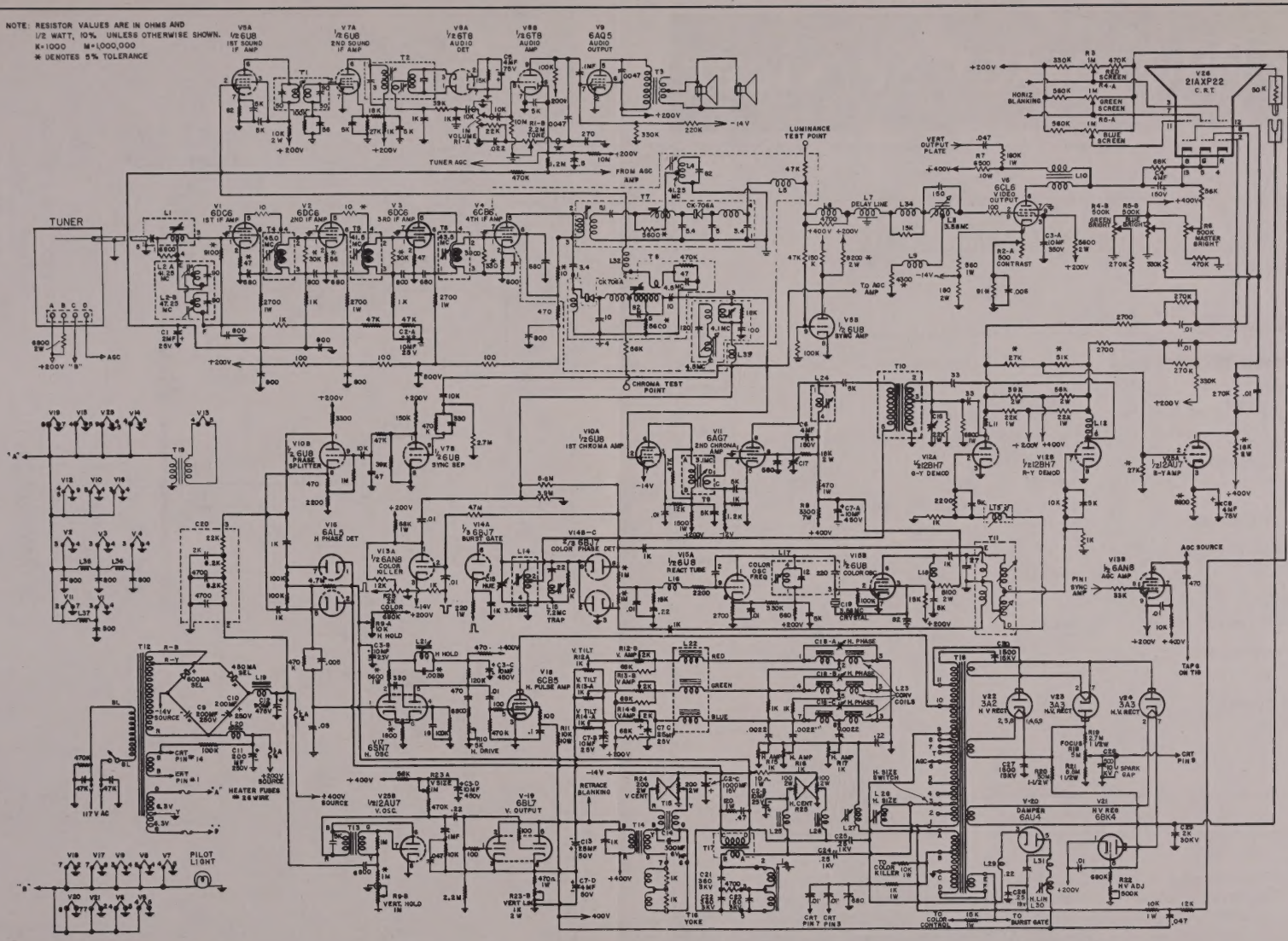
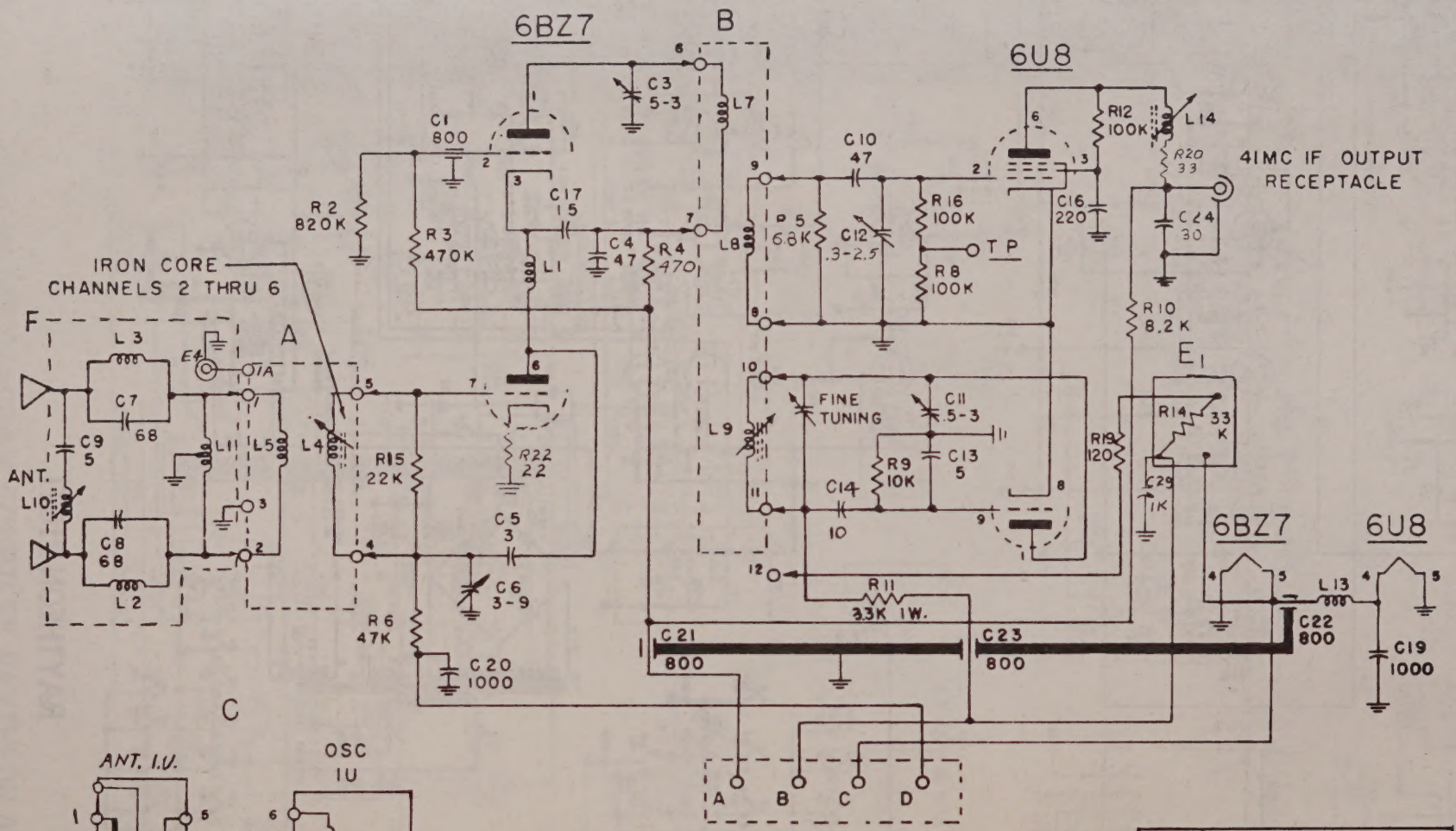
The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.


NOTE: RESISTOR VALUES ARE IN OHMS AND 1/2 WATT, 10% UNLESS OTHERWISE SHOWN. K=1000 M=1,000,000 * DENOTES 5% TOLERANCE
TUNER
RAYTHEON 21CT1

SCHEMATIC DIAGRAM COURTESY RAYTHEON MFG. COMPANY



A-B	V.H.F DRUM SEGMENTS
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E_1	POWER RECEPTACLE V.H.F TO U.H.F. CHASSIS
F	ANT. FILTER ASS'Y.
E4	U.H.F. INPUT

RAYTHEON 21CT1

TUNER SCHEMATIC

SCHEMATIC DIAGRAM COURTESY RAYTHEON MFG. COMPANY

PHOTOFACT* Folder

with CIRCUITRACE*

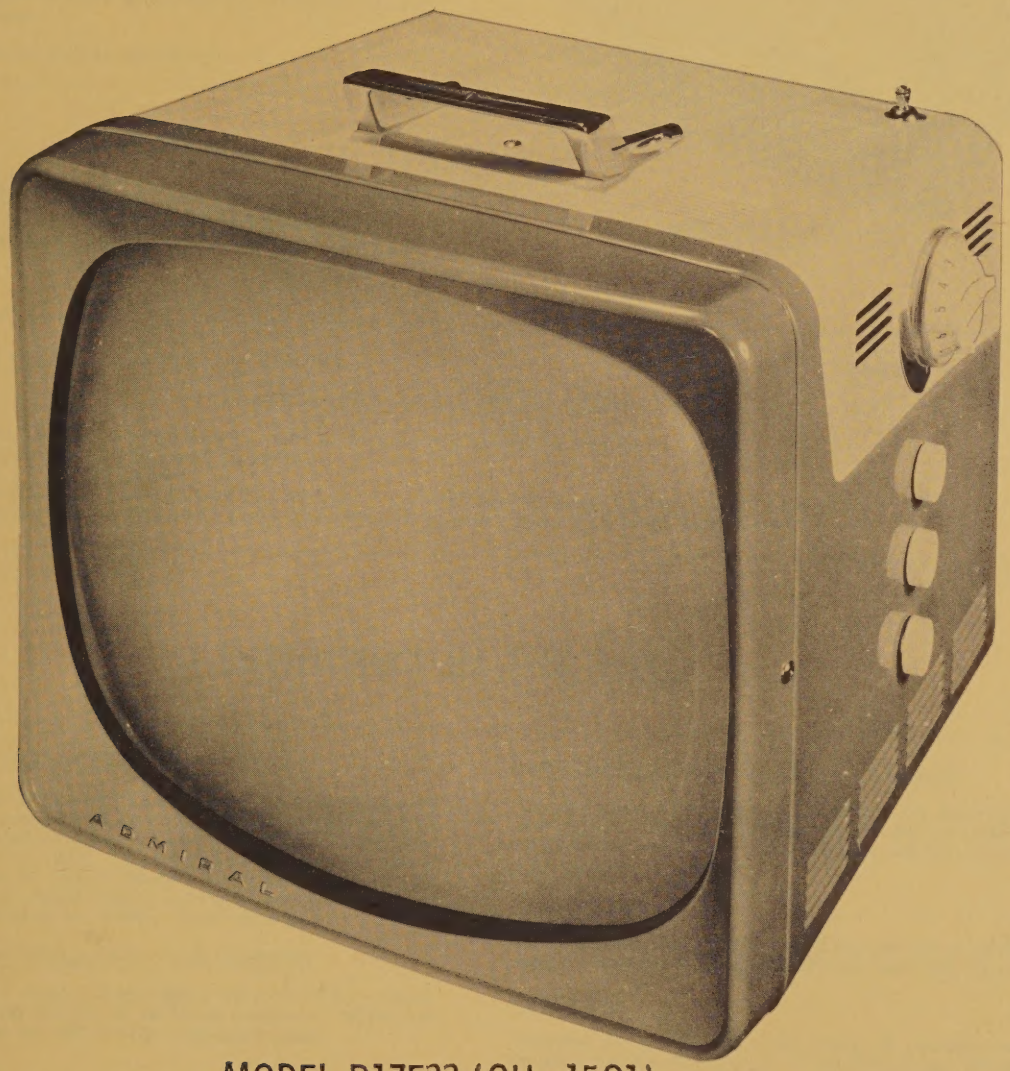
ADMIRAL MODELS P17E31, 32, 33, 34, 35 (Ch. 15C1)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

ADMIRAL MODELS P17E31, 32, 33, 34, 35 (Ch. 15C1)



MODEL P17E33 (CH. 15C1)

ADMIRAL MODELS P17E31, 32, 33, 34, 35 (Ch. 15C1)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

DATE 12-58

SET 424 FOLDER 1

PHOTOFACT* Folder

with CIRCUITRACE*

*TRADE MARK

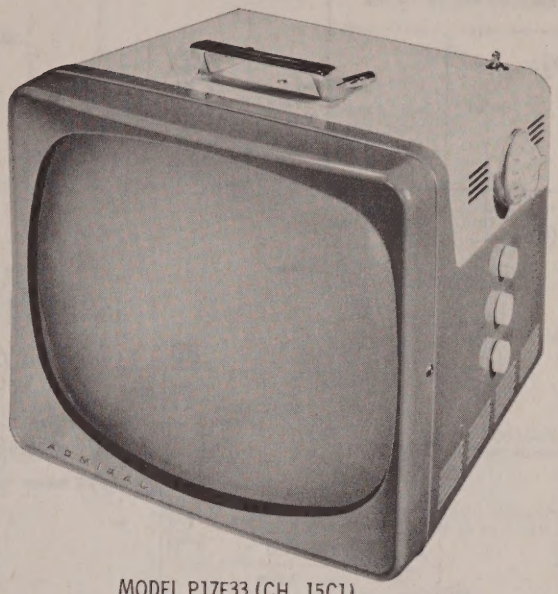
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 5 push-on type knobs from the side.
2. Remove 5 metal screws holding rear cover. Remove the rear cover.
3. Remove 4 metal screws holding front. Remove front.
4. Remove 1 metal screw under carrying handle.
5. Remove antenna leads to tuner.
6. Remove 8 metal screws holding cabinet to bottom plate.
7. Remove 8 metal screws holding 4 front cabinet support braces.
8. Remove wrap around cabinet.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.



MODEL P17E33 (CH. 15C1)

TRADE NAME	Admiral	MODELS	CHASSIS
		P17E31, P17E32, P17E33, P17E34, P17E35	15C1
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois		
TYPE SET	Television Receiver		
TUBES	Fifteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 150 Watts, 1.47 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 25.75MC, Sound IF 21.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the Channel Selector, Fine Tuning, and the small inspection plate under the knobs. Set the Fine Tuning to the center of its range. The adjustments are accessible one at a time as the Channel Selector is rotated. Adjust for best picture and sound. NOTE: Start with lowest channel first. When two slugs are visible, adjust top slug.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 metal screws holding the front of the cabinet. Pull bottom of front out and lift up to remove. NOTE: Use only water and soft cloth to clean safety glass.

FOCUS

The focus may be varied by changing the connection of pin 4 of the picture tube to either boost voltage or chassis.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The Horizontal Frequency coil is used as the Horizontal Hold control. Adjust the Horizontal Hold until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSE DEVICE

A 5Ω fusible resistor (R83) is used for low voltage power supply protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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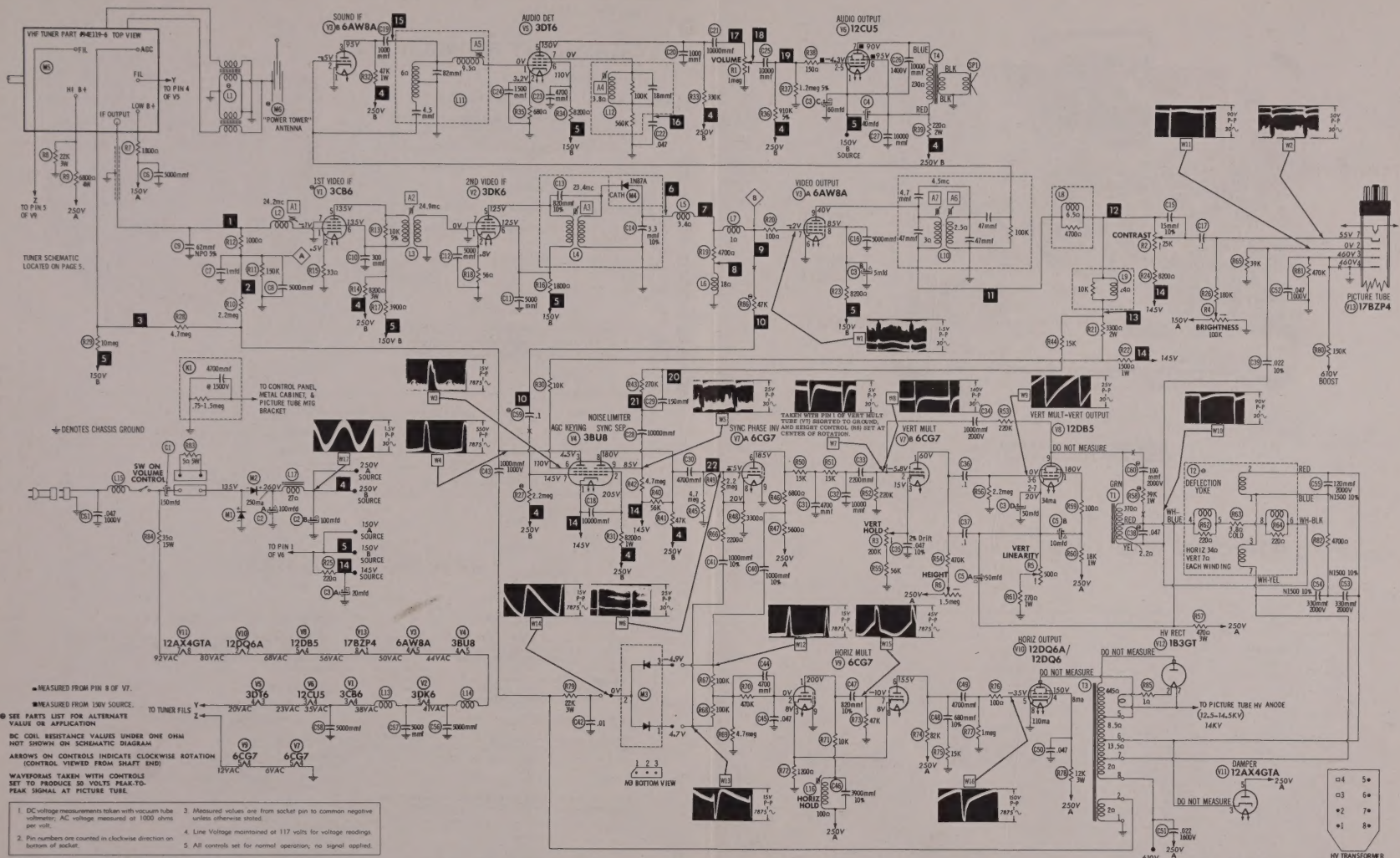
H923

ADMIRAL MODELS P17E31, 32, 33, 34, 35 (Ch. 15C1)

ADMIRAL MODELS P17E31, 32, 33, 34, 35 (Ch. 15C1)

SET 424 FOLDER 1


VHF TUNER PART #4E119-6 TOP VIEW
SOUND IF V3 6AW8A
AUDIO DET V5 3DT6
AUDIO OUTPUT V16 12CU5
VOLUME
1ST VIDEO IF V1 3CB6
2ND VIDEO IF V2 3DK6
VIDEO OUTPUT V3 6AW8A
CONTRAST
BRIGHTNESS 100K
PICTURE TUBE V13 17BZP4
TUNER SCHEMATIC LOCATED ON PAGE 5.
DENOTES CHASSIS GROUND
SW ON VOLUME CONTROL
TO CONTROL PANEL, METAL CABINET, & PICTURE TUBE MTG BRACKET
NOISE LIMITER
AGC KEYING SYNC SEP V4 3BU8
SYNC PHASE INV V7A 6CG7
VERT MULT V7B 6CG7
VERT MULT-VERT OUTPUT V8 12DB5
VERT HOLD
VERT LINEARITY
HEIGHT
DEFLECTION YOKE
HORIZ 340 VERT 7Ω EACH WINDING
HV RECT V12 1B3GT
HORIZ OUTPUT V10 12DQ6A/12DQ6
HORIZ MULT V9 6CG7
HORIZ HOLD
TO PICTURE TUBE HV ANODE (12.5-14.5KV) 14KV
DAMPER V11 12AX4GTA
630V BOOST SOURCE
HV TRANSFORMER TERMINAL BOARD
DO NOT MEASURE
12AX4GTA 12DQ6A 12DB5 17BZP4 6AW8A 3BU8
92VAC 80VAC 68VAC 56VAC 50VAC 44VAC
3DT6 12CU5 3CB6 3DK6
20VAC 23VAC 35VAC 38VAC 41VAC
6CG7 6CG7
12VAC 6VAC
TO TUNER FILS
MEASURED FROM PIN 8 OF V7.
MEASURED FROM 150V SOURCE.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE*
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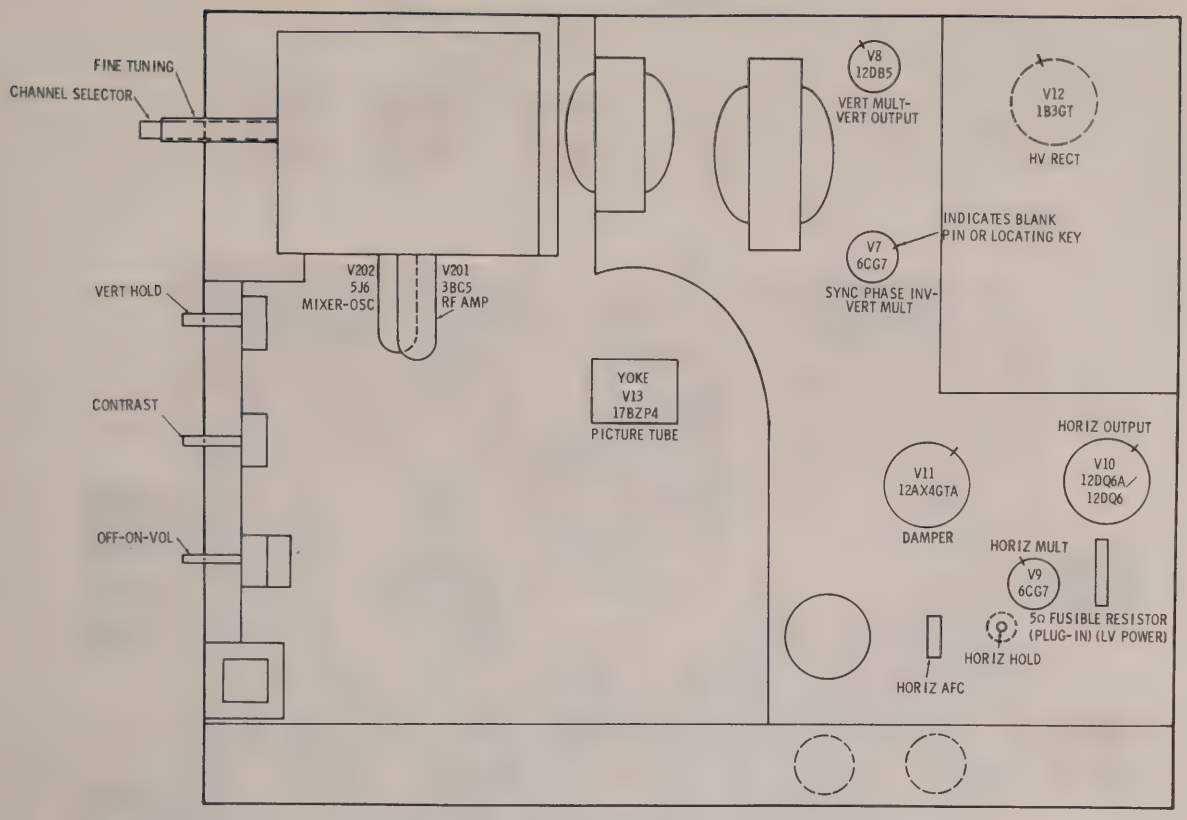
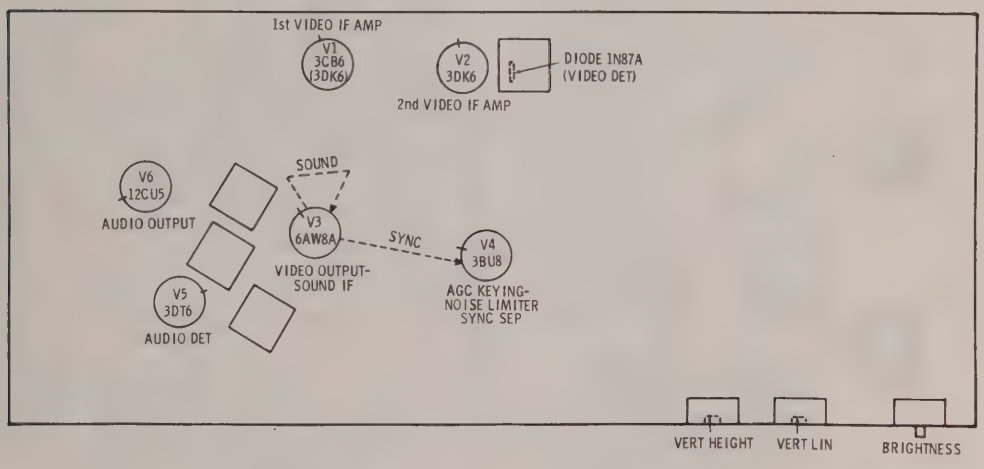
ADMIRAL MODELS P17E31, 32, 33, 34, 35 (Ch. 15C1)

TUBE PLACEMENT CHART



TOP VIEW



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

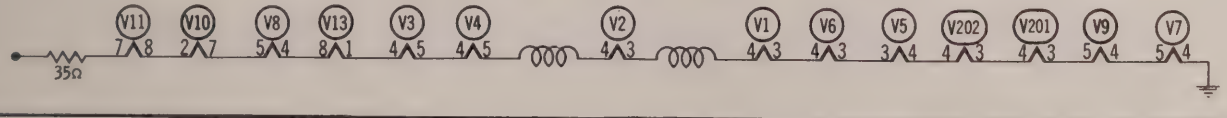
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor (5Ω), Rectifier (B+)

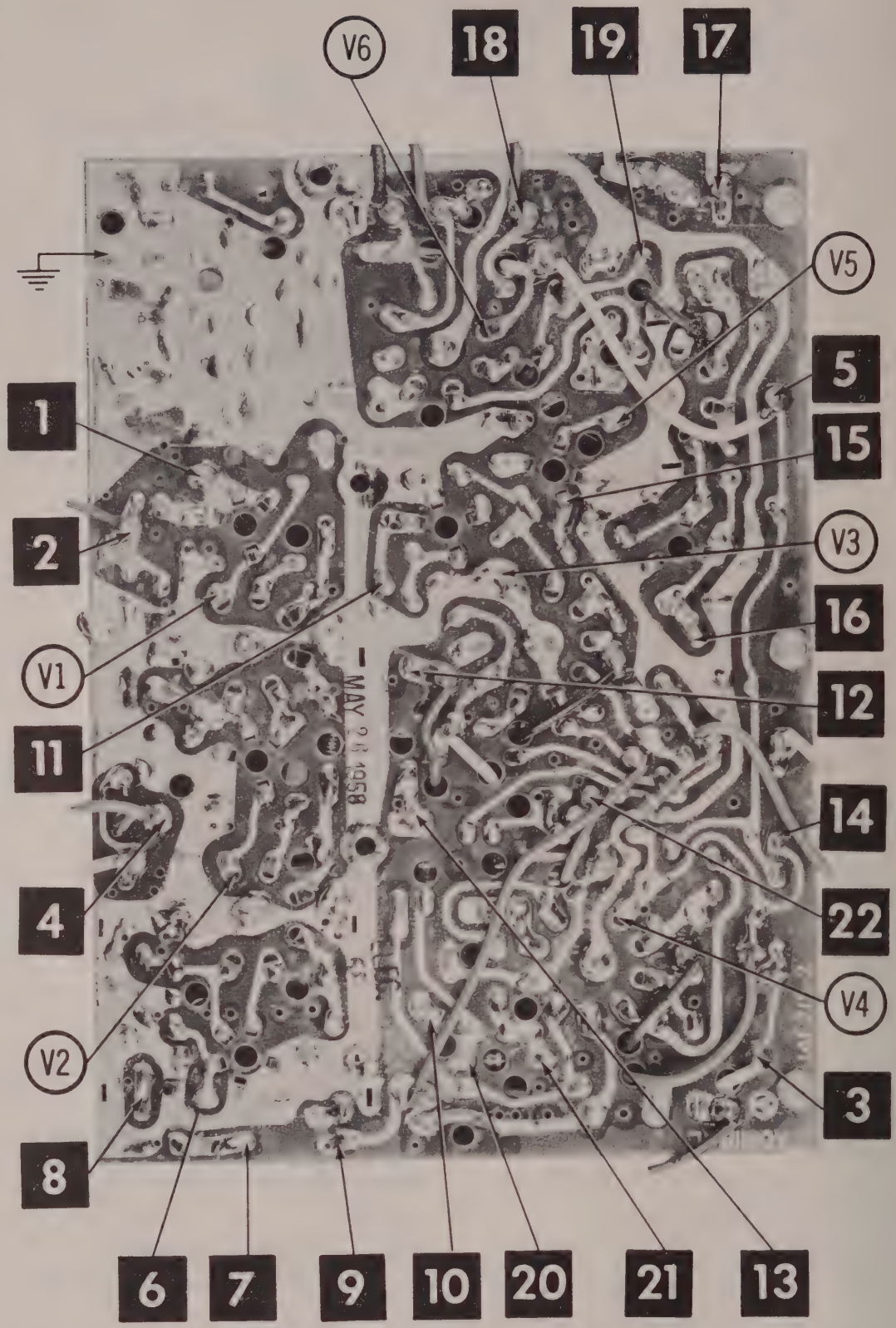
SWEEP FAILURE
No raster, has sound Rect. (Horiz. AFC), V9, V10, V11, V12, V13
No vertical deflection V7, V8
Poor vert. linearity or foldover V7, V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V9, V10, V11, Rectifier (B+)
Vert. off freq. V7, V8
Horiz. off freq. V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det.), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V13
Has pic, no sound V3, V5, V6
Overloaded picture V4

SYNC FAILURE
No vert. sync V4, V7
No horiz. sync V4, V7, Rect. (Horiz. AFC)
No vert. or horiz. sync V4, V7

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)

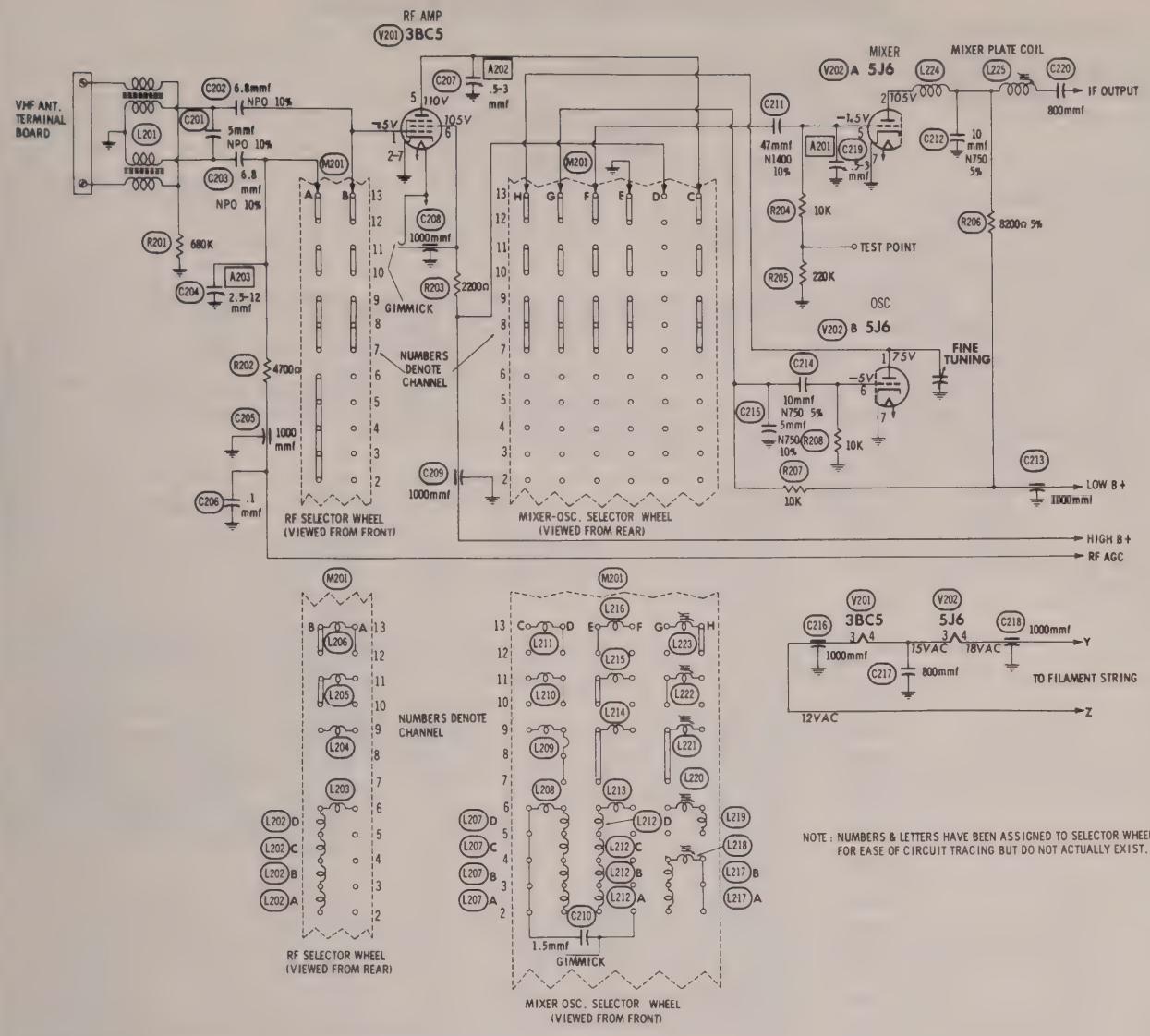




A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



NOTE : NUMBERS & LETTERS HAVE BEEN ASSIGNED TO SELECTOR WHEELS FOR EASE OF CIRCUIT TRACING BUT DO NOT ACTUALLY EXIST.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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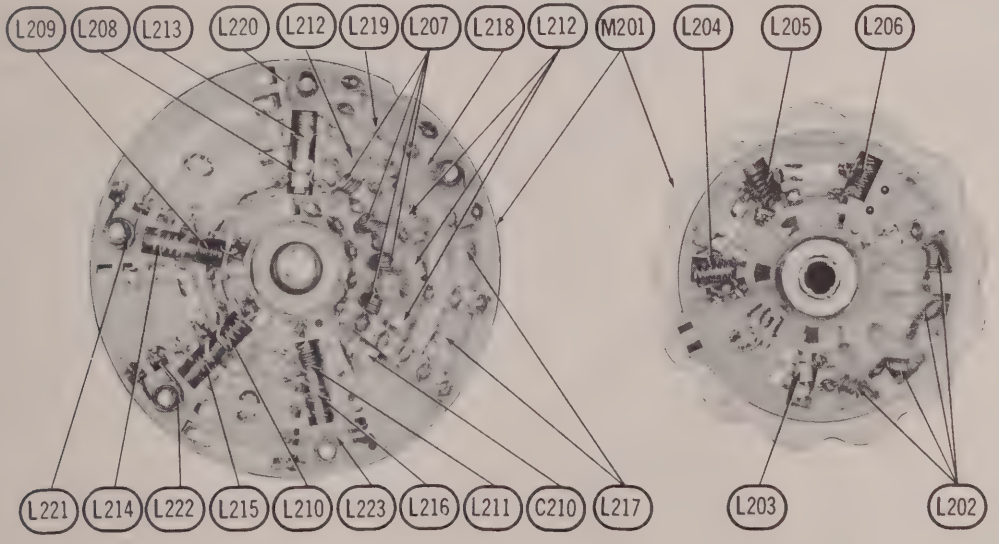
VHF TUNER 94E119-6



TUNER 94E119-6 DISC ASSEMBLY

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: Osc. Adjustments ..... General Cement #9294
Walsco #2534 or 2535
A201, A202, A203 ..... General Cement #9291
Walsco #2520 or 2522

VHF OSCILLATOR ALIGNMENT

Turn the set on and allow 15 to 20 minutes warm-up period.
Set Channel Selector to the lowest channel operating in the area.
Set the Fine Tuning to the center of its range.
Set other controls for normal picture and sound.
Using a 1/8" non-metallic alignment tool, carefully adjust the oscillator slug for best picture and sound. (NOTE: This is not necessarily the point of loudest sound.) If two slugs are visible at the front of the tuner, adjust the one nearest the top of the tuner chassis. Repeat this procedure for the remaining stations, adjusting them in order of the channel number from the lowest to the highest.

VHF RF AND MIXER ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (T). Low side to chassis.	A201, A202	Adjust for response curve similar to Fig. 201 with markers above 90%.
2.	"	"	85MC	83.25MC 87.75MC	6	"	A203	Adjust for response curve similar to Fig. 201. Adjust for maximum amplitude and flat-topped appearance with markers properly positioned.
3.	"	"	213MC	211.25MC 215.75MC	13	"		Check for response curve similar to Fig. 201. If markers fall below 70% on any high band channel, make compromise adjustment of A201 and A202 with channel switch set to that channel. If markers fall below 70% on any low band channel, make compromise adjustment of A203 with channel selector set to that channel. Check all other channels to see that they have not been seriously affected.
			207MC	205.25MC 209.75MC	12			
			201MC	199.25MC 203.75MC	11			
			189MC	187.25MC 191.75MC	9			
			183MC	181.25MC 185.75MC	8			
			177MC	175.25MC 179.75MC	7			
			79MC	77.25MC 81.75MC	5			
			69MC	67.25MC 71.75MC	4			
			63MC	61.25MC 65.75MC	3			
			57MC	55.25MC 59.75MC	2			

FIG. 201

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER to PROTECT the Test Equipment.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: A1 thru A8 ..... General Cement #8606L, 9295
Walsco #2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to point Ⓐ. Positive to chassis.
Short across the antenna terminals.
Set Contrast fully counterclockwise.
Use lowest scale on VTVM.
Connect 270mmf across VTVM input.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	24.2MC (Unmod)	Any non-interfering channel	DC probe thru 47K to point Ⓑ. Common to chassis.	A1	Adjust for maximum deflection. (Keep generator output low - 2.5 volts or less on VTVM).
2.	"	"	24.9MC	4	"	A2	"
3.	"	"	23.4MC	"	"	A3	"
4.	"	"	25.3MC	"	"	Mixer Plate Coil	"

OVERALL VIDEO IF RESPONSE CHECK

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Connect 270mmf across scope input.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to ungrounded tube shield floating over Mixer-Osc tube (V202). Low side to chassis near tube shield.	23MC (10MC Swp)	21.25MC 22.7MC 24.2MC 25.6MC 25.75MC	12	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis.		Check for response similar to Fig. 1 with markers as indicated. If curve does not resemble Fig.1, repeat Video IF Alignment.

SOUND IF ALIGNMENT

Tune in the strongest TV station available in the area. Adjust the set for normal operation.
Turn A4 slowly counterclockwise until a buzz is heard in the sound, then turn clockwise for maximum undistorted sound. (There may be two points approximately 1/2 turn apart at which the sound is loud. Set slug at center range of second loud point as slug is turned clockwise.)
Reduce the signal at the antenna terminals (by use of an adjustable attenuator or disconnecting the antenna.) until a strong hiss is heard in the sound.
Carefully adjust A5 for maximum undistorted sound with MINIMUM hiss. If the hiss disappears during alignment, further reduce the signal until the hiss returns and readjust A5.
Carefully adjust A6 for MINIMUM 4.5MC beat pattern in the picture (4.5MC beat interference appears as a very fine cross hatch pattern on the screen).
Carefully adjust A7 for maximum undistorted sound with MINIMUM hiss. If the hiss disappears during alignment, further reduce the signal strength. Readjust A7.
Repeat entire procedure, if necessary. DO NOT retouch A5 without repeating entire Sound IF Alignment.

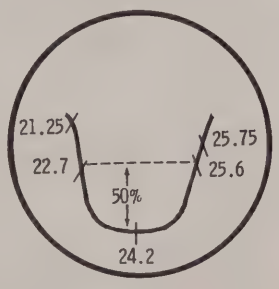
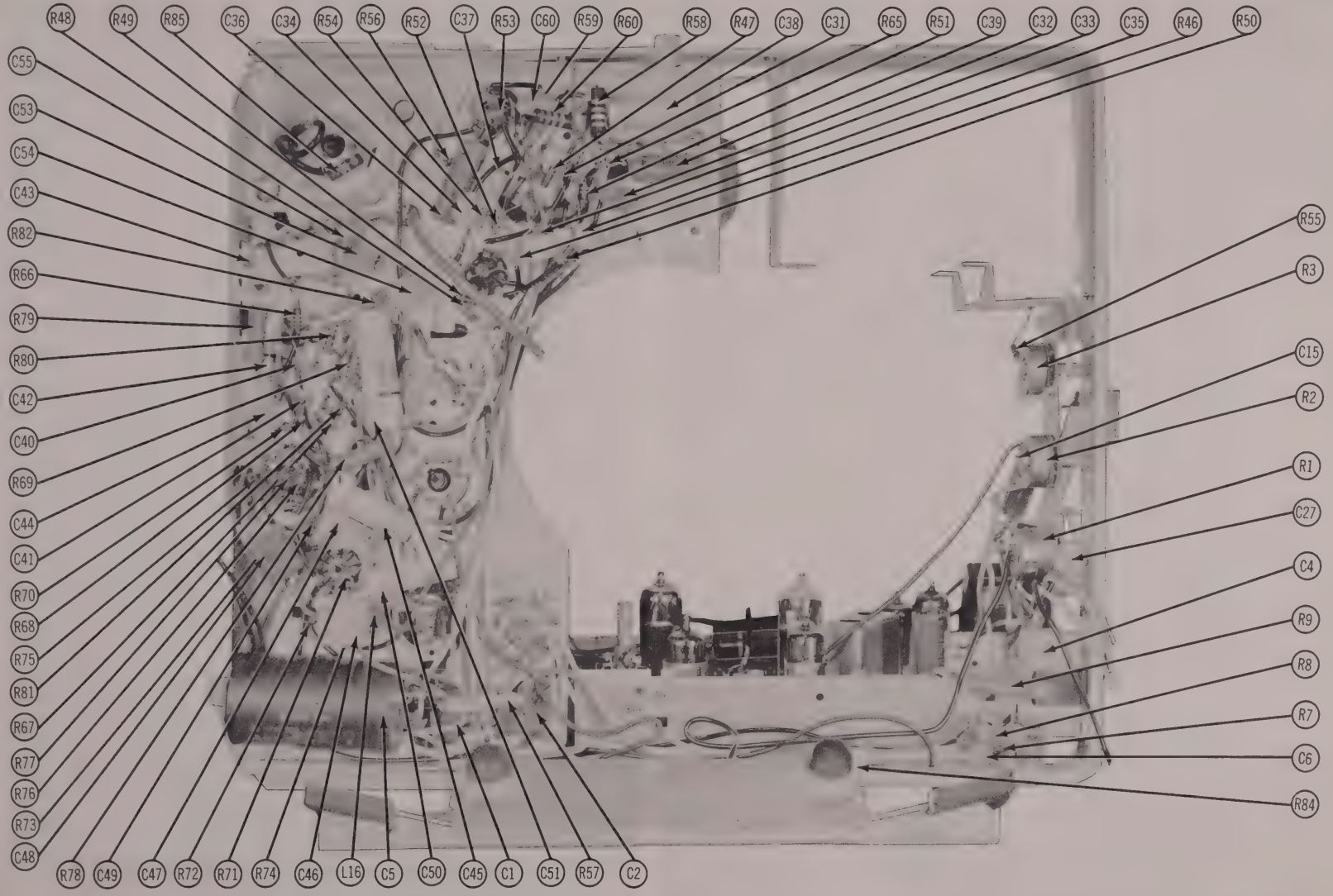


FIG. 1

ADMIRAL MODELS P17E31, 32, 33, 34, 35 (Ch. 15C1)

FOLDER 1



CHASSIS FRONT VIEW

PRINTED BOARD - RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st Video IF Amp.	3CB6	3DE8 *
V2	2nd Video IF Amp	3DE8	
V3	Video Output-Sound IF	6AW8A	
V4	AGC Keying-Noise Limiter-Sync Sep.	3BU8	
V5	Audio Det	3DT6	
V6	Audio Output	12CU5	
V7	Sync Phase Inv.-Vert.Mult	6CG7	
V8	Vert. Mult.-Vert. Output	12DB5	
V9	Horiz. Mult.	6CG7	
V10	Horiz. Output	12DQ6A/ 12DQ6	
V11	Damper	12AX4GTA	
V12	HV Rect.	1B3GT	

* Alternate.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	ADMIRAL Part No.	GENERAL ELECTRIC Part No.	RCA Part No.	SYLVANIA Part No.	
V13	17BEP4	17CEP4 ①	17BEP4 ②	17BZP4 ② 17BZP4/ 17CAP4 ③	① "Aluminized" ② "Silverama" ③ ③ "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ADMIRAL Part No.	AEROVOX Part No.	CORNELL-DUBILIER Part No.	MALLORY Part No.	PYRAMID Part No.	SANGAMO Part No.	SPRAGUE Part No.
C1	150	150	67D35-203	AFH1-31-75	XA0266	FP17.5	TMS-34	S-105	TVL-1430
C2A	±100	300	67D35-306	AFH2-41-50	B0332	FP227.7	TMT-165	D-148	TVL-2841
B	±100	300							
C3A	±20	200	67D35-307	AFH4-46-20	D0032 BR505	FP454.2		Q-136	TVLS-4475*
B	±5	200							
C	±60	200							
D	50	50							
C4	40	200	67A25-2	PRS250V40	BR4025	TC58	TD-40-250	FM-2540	TVA-1511
C5A	±50	300	67D35-204	AFH3-41	C0320	FP217.86	TMT-47	D-132	TVLS-2575.5*
B	±10	300							

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ADMIRAL Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C6	5000		65D10-5	BPD-005	DD-502	L20D5	B-250	5GA-D5	
C7	1.0	100	64A10-3	P388N-1		CUB3W1	GEM-21	27M- M1	
C8	5000		65D10-5	BPD-005	DD-502	L20D5	B-250	5GA-D5	
C9	63		65D10-187					5TCC-Q525*	NPO 5%
C10	300		65D10-161	DY-300	DD-301	L10Y3		5GA-T3	
C11	5000		65D10-5	BPD-005	DD-502	L20D5	B-250	5GA-D5	
C12	5000		65D10-5	BPD-005	DD-502	L20D5	B-250	5GA-D5	
C13	330		65D10-8			L10T32	JL-332	5GA-T32	10%
C14	3.3		63B41-023	NPO-SI 3.3	TCZ-3R3	L10Y33	CNO-533	5TCC9-Y33	10%
C15	15		65D28-148	NPO-SI 15	D5-150	L20G5	CNO-515	5GA-Q15	10%
C16	5000		65D10-5	BPD-005	DD-502	L20D5	B-250	5GA-D5	
C17	.1	400	64B6-26	P468N-1	DF-104	CUB4P1	GEM-401	47M-P1	
C18	10000		65D10-41	BPD-01	DD-103	BYA10B	B-110	5GA-S1	
C19	1000		65D10-53	BPD-001	DD-102	L10D1	B-210	5GA-D1	
C20	1000		65D10-53	BPD-001	DD-102	L10D1	B-210	5GA-D1	
C21	10000		65D10-41	BPD-01	DD-103	BYA10B	B-110	5GA-S1	
C22	.047	200	64B16-35	P388N-047	DF-503	BC2S47J	ACE-4147	28E-S47	
C23	4700		63D10-113	BPD-0047	DD-472	L10D47	B-347	5GA-D47	
C24	1500		65D10-108	BPD-0015	DD-152	L10D15	B-215	5GA-D15	
C25	10000		65D10-41	BPD-01	DD-103	BYA10B	B-110	5GA-S1	
C26	10000	1400	65D10-65	DAC-27	DDE5-103	EVE15B	2EV-110	30HKB-S1	
C27	10000		65D10-41	BPD-01	DD-103	BYA10B	B-110	5GA-S1	
C28	10000		65D10-41	BPD-01	DD-103	BYA10B	B-110	5GA-S1	
C29	150		65D10-85	DY-150	DD-151	L10T15	B-315	5GA-T15	
C30	4700		63D10-113	BPD-0047	DD-472	L10D47	B-347	5GA-D47	
C31	4700		63D10-113	BPD-0047	DD-472	L10D47	B-347	5GA-D47	
C32	10000		65D10-41	BPD-01	DD-103	BYA10B	B-110	5GA-S1	
C33	2200		65D10-111	BPD-0022	DD-222	L20D22	B-322	5GA-D22	
C34	1000	2000	65D10-181	HVD-30-1000	DD50-102	HVB30D1	2EV-210	20GA-D1	
C35	.047	600	64C26-9						10% 2% Drift
C36	.1	400	64B6-26	P468N-1	DF-104	CUB4P1	GEM-401	47M-P1	
C37	.1	400	64C27-32	P468N-1	DF-104	CUB4P1	GEM-401	47M-P1	
C38	.047	600	64B6-9	P468N-047	DF-503	CUB6S47	GEM-6147	67M-S47	①
C39	.023	600	64B23-11						10%
C40	1000		65D10-184	DL-1000			JL-310	5GA-D1	10%
C41	1000		65D10-184	DL-1000			JL-310	5GA-D1	10%
C42	.01	600	64C26-23	P468N-01	D5-103	CUB6S1	GEM-6S1	67M- S1	
C43	1000	1000	65D10-147	DVD-15-1000	DD-102	L10D1	B-210	5GA-D1	
C44	4700	600	65D10-112	BPD-0047	DD-472	L10D47	B-347	5GA-D47	
C45	.047	600	64B6-9	P468N-047	DF-503	CUB6S47	GEM-6147	67M-S47	
C46	2600		65B21-392	1464-0039		1R5D39		MB-339	10%
C47	820		65B21-821	1464-00082		1R5T82		MB-382	10%
C48	680		65B21-681	1464-00068	MD-681	1R3T68		MB-368	10%
C49	4700		65D10-113	BPD-0047	DD-472	L10D47	B-347	5GA-D47	
C50	.047	600	64B6-9	P468N-047	DF-503	CUB6S47	GEM-6147	67M-S47	
C51	.023	1000	64B3-43	P168N-023		CUB10S23	GEM-10323	MB-323	
C52	.047	1000	64B2-30	P108N-047		CUB10S47	GEM-10147	10TM-S47	
C53	330	2000	65D10-186						N1500 10%
C54	330	2000	65D10-186						N1500 10%
C55	130	3000	65D10-148						N1500 10%
C56	5000		65D10-5	BPD-005	DD-502	L20D5	B-250	5GA-D5	
C57	5000		65D10-5	BPD-005	DD-502	L20D5	B-250	5GA-D5	
C58	5000		65D10-5	BPD-005	DD-502	L20D5	B-250	5GA-D5	
C59	.1	400	64B16-30	P468N-1	DF-104	BC6P1J	ACE-401	47M-P1	②
C60	1000	2000	65D10-181	HVD-30-1000	DD50-102		2EV-110	20HKB-S1	②
C61	.047	1000	64B2-30	P108N-047		CUB10S47	GEM-10147	10TM-S47	

① Not used in some versions. ② Used in Run 14 and higher.
* Not normally in distributors stock. Available thru distributors on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL Part No.	CENTRALAB Part No.	CLAROSTAT Part No.	IRC Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	1meg	½	75D1-93	B-70	A47-1meg-Z	Q33-137	TA18A	Volume
B	Shaft			Not Req.	[illegible]	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	
R2A	25K	½	75D20-98	B-26	A47-25K-S	Q1-120	TA253L	Contrast
B	Shaft			Not Req.	[illegible]	Not Req.	Not Req.	
R3A	200K	½	75D20-97	B-46	A47-200K-S	Q1-139	U43	Vert. Hold
B	Shaft			Not Req.	[illegible]	Not Req.	Not Req.	
R4A	100K	½	75D20-115	AB-40	B47-100K-S	Q1-126	PTA151	Brightness
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R5A	500Ω	½	75D20-100	AB-4	B47-500-S	Q1-103	PTA52L	Vert. Lin.
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R6A	1.5meg	½	75D20-104	AB-742	B47-1.5meg-S	Q1-138	PTA153L	Height
B	Shaft			AK-19	Not Req.	TQ	Not Req.	

* Use KR with CRL "red label" controls and KB with "blue label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	ADMIRAL Part No.	NOTES
R7	1800Ω		60B8-182	
R8	22K	3	61B24-357	
R9	6800Ω	4	61B34-445	
R10	2.2meg		60B8-225	
R11	150K		60B8-154	
R12	1000Ω		60B8-102	
R13	10K 5%		60D7-103	
R14	3300Ω	3	61B34-347	
R15	33Ω		60B8-330	
R16	1800Ω		60B8-182	
R17	3900Ω		60B8-392	
R18	56Ω		60B8-560	
R19	4700Ω		60B8-472	
R20	100Ω		60B8-101	
R21	3300Ω	2	60B20-332	
R22	1500Ω	1	60B14-153	
R23	8200Ω		60B8-823	
R24	6200Ω		60B8-622	
R25	220Ω		60B8-221	
R26	180K		60B8-184	
R27	2.2meg		60B8-225	Note 1
R28	4.7meg		60B8-475	
R29	10meg		60B8-106	
R30	10K		60B8-103	
R31	8200Ω	1	60B14-822	
R32	47K	1	60B14-473	
R33	330K		60B8-334	
R34	8200Ω		60B8-822	
R35	680Ω		60B8-681	
R36	910K 5%		60B7-914	
R37	1.2meg 5%		60B7-125	
R38	150Ω		60B8-151	
R39	220Ω	2	60B20-221	
R40	56K		60B8-563	
R41	47K		60B8-473	
R42	4.7meg		60B8-475	
R43	270K		60B8-274	
R44	15K		60B8-153	
R45	4.7meg		60B8-475	
R46	6800Ω		60B8-682	
R47	5600Ω		[illegible]	
R48	3300Ω		60B8-332	
R49	2.2meg		60B8-225	
R50	15K		60B8-153	
R51	150K		60B8-154	
R52	220K		60B8-224	
R53	330K		60B8-334	
R54	470K		60B8-474	
R55	56K		60B8-563	
R56	2.2meg		60B8-225	
R57	470Ω	3	61A1-45	
R58	39K	1		Note 2
R59	100Ω		60B8-101	
R60	18K	1	60B14-183	
R61	270Ω	1	60B14-271	
R62	220Ω		60B8-221	
R63	3.5Ω Cold		61A37	
R64	220Ω		60B8-221	
R65	39K		60B8-393	
R66	2200Ω		60B8-222	
R67	100K		60B8-104	
R68	100K		60B8-104	
R69	4.7meg		60B8-475	
R70	470K		60B8-474	
R71	10K		60B8-103	
R72	1200Ω		60B8-122	
R73	47K		60B8-473	
R74	82K		60B8-823	
R75	15K		60B8-153	
R76	100Ω		60B8-101	
R77	1meg		60B8-105	
R78	12K	3	61B24-351	
R79	22K	3	61B24-357	
R80	150K		60B8-154	
R81	470K		60B8-474	
R82	4700Ω		60B8-472	
R83	5Ω	5	61A38-3	
R84	35Ω	15	61B3-33	
R85	5Ω		60B28-53	
R86	47K		60B8-473	Note 3

Note 1. Some versions may use 330K in this application.
Note 2. Used in chassis stamped Run 14 and higher.
Note 3. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA ADMIRAL Part No.	Meissner Part No.	Merit Part No.	Miller Part No.	Ram Part No.	NOTES
L1	Ant. Trans.	†					† Part of M5
L2	1st Video IF	72C152-40					
L3	2nd Video IF	72C152-2					
L4	3rd Video IF	72D206-1					
L5	4.5 IF Choke	73D24-4					
L6	Shunt Peaking Coil	73C5-20	19-3500	TV-188	6174	VP-8	523 Microhenries
L7	Resonant Choke	73D24-9					
L8	Series Peaking Coil	73B15-23					Wound on 4700Ω resistor
L9	Shunt Peaking Coil	73B15-36					Wound on 10K resistor
L10	1st Sound IF	72C185-2					
L11	2nd Sound IF	72B186-1					
L12	Quadrature Coil	72C152-37					
L13	Fil. Choke	73B37-2	19-1001	BC-562	4804		1.4 Microhenries
L14	Fil. Choke	73B37-2	19-1001	BC-562	4804		1.4 Microhenries
L15	Line Choke	73B31-1					88 Microhenries

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ADMIRAL Part No.	Meissner Part No.	Merit Part No.	Miller Part No.	Ram Part No.	Thordarson Part No.	NOTES
L16	100Ω		94C17-7	19-1576 *	TV-163 *	6210 *	H-102 *	HS-5 *	* Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES.	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA ADMIRAL Part No.	Halldorson Part No.	Merit Part No.	Ram Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No
L17	.250A	27Ω	.8 Hy.	74B18-24	C5037 ①	C-2974		C-2328 ①	26C44	C-23X

① Drill new mounting hole.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA ADMIRAL Part No.	Halldorson Part No.	Merit Part No.	Ram Part No.	Rogers Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No
T1	Vert. Output	79B43-13							A-113X ①
T2	Yoke-Horiz.(38MH) (110°)-Vert. (14MH)	94D150-1 ②			Y-110 ④		DY-27A ③	Y-52 ③ ⑤	Y-80 & NW25 ④
	Alt. Yoke	94D147-1 ③			Y-110 ④		DY-27A ③	Y-52 ④ ⑤	Y-80 & NW25 ④
	Rear Cover & Centering Device	94D152 ②							
	Rear Cover & Centering Device	94D148-1 ③							
	Yoke Clamp	18A208-2							
T3	Horiz. Output	79D77-4			X162 *	EFR172*3	H-304 *	FLY-137 *	

① Connect as autoformer.
② 3 1/8" diameter.
③ 3 5/8" diameter.
④ Require new rear cover and centering device.
⑤ Remove 27mmf capacitor from yoke terminals #2 and #7 if necessary.
†This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	5			5	5	5	5	
	6			6	4	6	6	
	7			7	2	7	7	
	8			8	1	8	8	
	2			2	7	2	1	
	1			1	8	1	2	
Special Notes →					③			

③ Remove one turn from filament winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ADMIRAL Part No.	Halldorson Part No.	Merit Part No.	Ram Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	NOTES
T4	2700Ω	3-4Ω	79D33-15	Z1101	A-3025	AU-805	A-3322	24S53	S-12X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ADMIRAL Part No.	REPLACEMENT DATA QUAM Part No.	NOTES
SP1	4"	PM	3-4Ω	78B122-3	4A07	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ADMIRAL Part No.	REPLACEMENT DATA
K1	Chassis Isolation	4700mmf ② 1500V, .75-1.5meg	63B10-3	Centralab RC-490

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA ADMIRAL Part No.	FEDERAL Part No.	GENERAL ELECTRIC Part No.	INTERNATIONAL Part No.	SARKES TARZIAN Part No.	NOTES
M1	.250A	93A4-4 ①	1241AH ①	1N1008 ②	T350 ① TV500 ②	350A ① 40K ③	① Selenium Type. ② Germanium Type.
M2	.250A	93A4-4 ①	1241AH ①	1N1008 ②	T350 ① TV500 ②	350A ① 40K ③	③ Silicon Type. ④ Two Used.
M3		93B5-4 ①	K1616 ①		SD-91 ②④		

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ADMIRAL PART No.	CBS PART No.	SYLVANIA PART No.	
M4	1N87A	1N87A	1N60	1N60	Video Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M5	Tuner	94E119-6	VHF
M6	Antenna	69C220-1	Includes L1. Not used in Models P17E31, 32
	Printed Board	A5770-4	Complete, Less Tubes

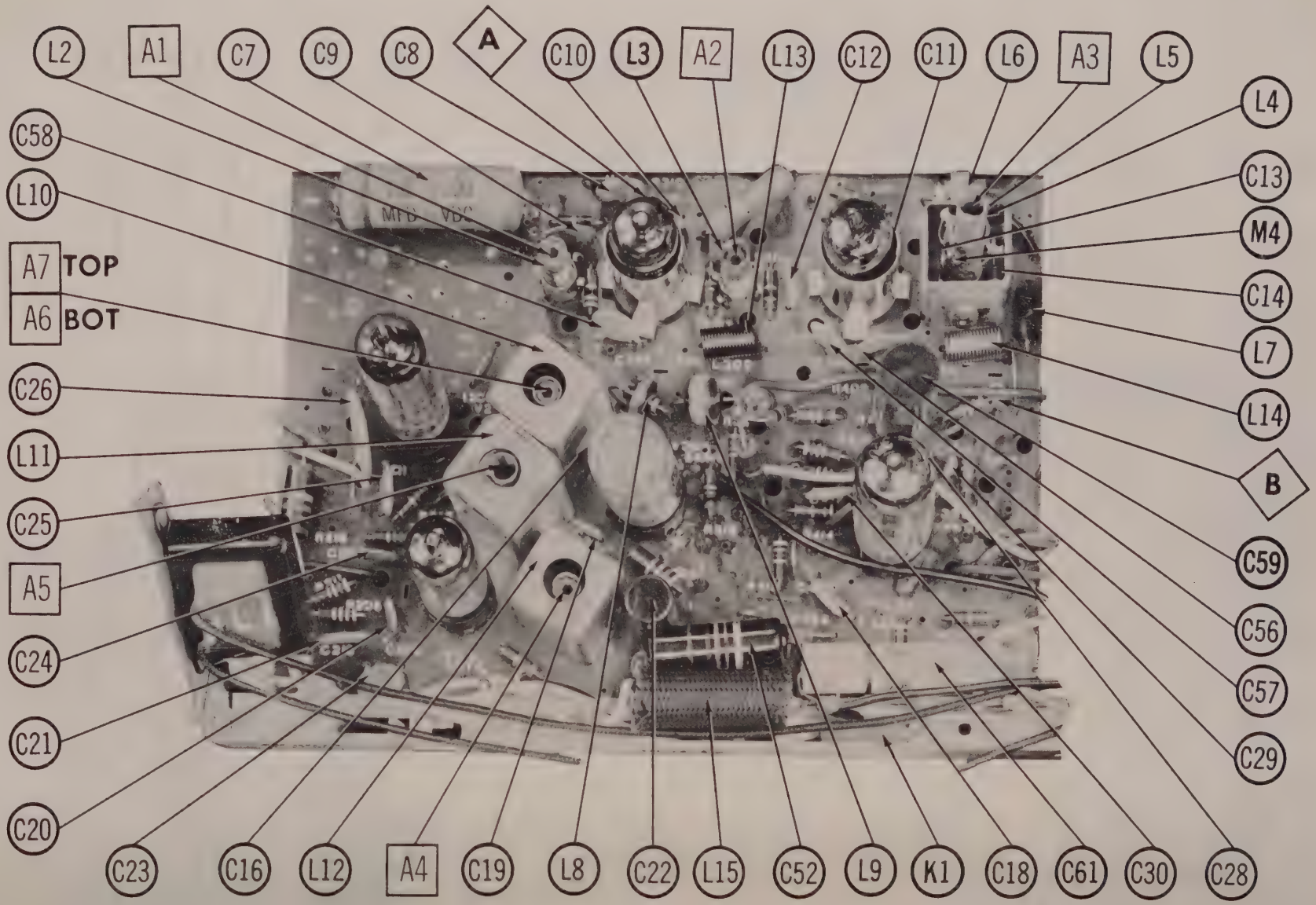
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	21D99-2	Models P17E32, P17E33, P17E34, P17E35
Safety Glass	21D99-1	Model P17E31
Bezel	23E293-7	Model P17E33
Bezel	23E293-6	Model P17E31
Bezel	23E293-1	Model P17E32
Bezel	23E293-9	Model P17E34
Bezel	23E293-5	Model P17E35
Knob	33D237-6	Channel Selector
Knob	33D237-3	Fine Tuning
Knob	33A143-9	Control, Models P17E31, P17E32, P17E33, P17E34
Knob	33A143-7	Control, Model P17E35
Cabinet	34E122-15	Less Back, Model P17E33
Cabinet	34E122-14	Less Back, Model P17E31
Cabinet	34E122-5	Less Back, Model P17E32
Cabinet	34E122-3	Less Back, Model P17E34
Cabinet	34E122-10	Less Back, Model P17E35

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor



PRINTED BOARD - CAPACITOR, INDUCTOR & ALIGNMENT IDENT

TUNER PARTS LIST AND DESCRIPTIONS

94E119-6

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	3BC5	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5J6	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	5		65D10-108	NPO-DI 5		C10V5C	ZT-555	5TCCB-V5	NPO 10%
C202	6.8		65D10-26	NPO-DI 6.8	DTZ-6R8	C10V68C	ZT-5568	5TCCB-V68	NPO 10%
C203	6.8		65D10-26	NPO-DI 6.8	DTZ-6R8	C10V68C	ZT-5568	5TCCB-V68	NPO 10%
C204	2.5-12		66B38-10						
C205	1000		65B26-7	EF-001	MFT-1000			503C-D1	
C206	.1	200	64B8-39	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C207	.5-3		66B38-9		829-3		CT565A		
C208	1000		65B26-7	EF-001	MFT-1000			503C-D1	
C209	1000		65B26-8	EF-001	MFT-1000			503C-D1	
C210	1.5		65B28-015	NPO-SI 1.5	TCZ-1R5	CTA6V15C	ZT-5515	5TCCB-V15	
C211	47		65D10-180						N1400 10%
C212	10		65D10-50						N750 5%
C213	1000		65B26-7	EF-001	MFT-1000			503C-D1	
C214	10		65D10-50						N750 5%
C215	5		65D10-22	N750-SI 5	DTN-5	C10V5U	NT-555	5TCUB-V5	N750 10%
C216	1000		65B26-7	EF-001	MFT-1000			503C-D1	
C217	800		65D10-20	BPD-0008	DD-801	L10T8		5GA-T8	
C218	1000		65B26-7	EF-001	MFT-1000			503C-D1	
C219	.5-3		66B38-9		829-3		CT565A		
C220	800		65D10-20	BPD-0008	DD-801	L10T8		5GA-T8	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		ADMIRAL PART No.	NOTES
	OHMS	WATT		
R201	680K		60B8-684	
R202	4700Ω		60B8-472	
R203	2200Ω		60B8-222	
R204	10K		60B8-103	

ITEM No.	RATING		ADMIRAL PART No.	NOTES
	OHMS	WATT		
R205	220K		60B8-224	
R206	8200Ω 5%		60B7-822	
R207	10K		60B8-103	
R208	10K		60B8-103	

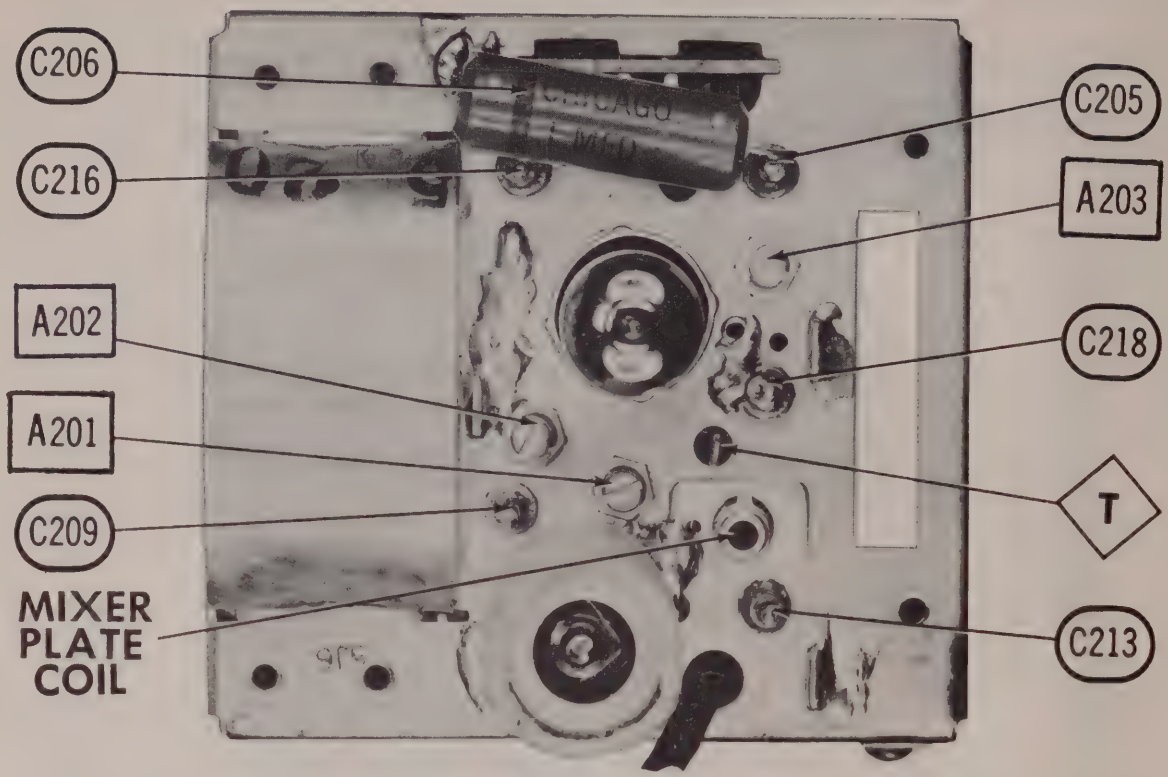
COILS (RF-IF)

ITEM No.	USE	ADMIRAL PART No.	NOTES
L201	Ant. Trans.	700B110-2	
L202A	Ant. Coil	73D30-12	Channel 2
B	"		Channel 3
C	"		Channel 4
D	"		Channel 5
L203	"	73D30-17	Channel 6
L204	"	73D30-18	Channel 7 thru 9
L205	"	73D30-21	Channel 10-11
L206	"	73D30-22	Channel 12-13
L207A	RF Coil	73D30-19	Channel 2
B	"		Channel 3
C	"		Channel 4
D	"		Channel 5
L208	"	73D30-27	Channel 6
L209	"	73D30-8	Channel 7 thru 9
L210	"	73D30-5	Channel 10-11
L211	"	73D30-25	Channel 12-13

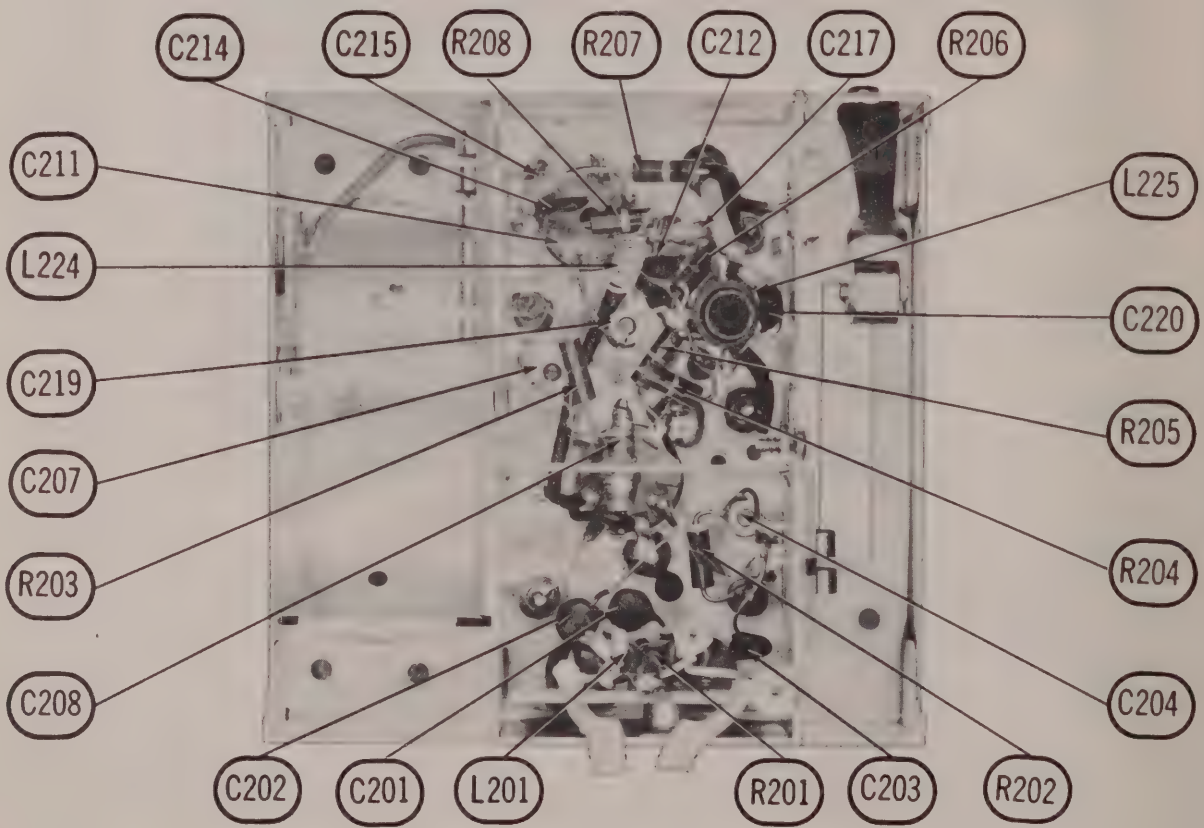
ITEM No.	USE	ADMIRAL PART No.	NOTES
L212A	Mixer Grid	73D30-20	Channel 2
B	"		Channel 3
C	"		Channel 4
D	"		Channel 5
L213	"	73D30-26	Channel 6
L214	"	73D30-7	Channel 7 thru 9
L215	"	73D30-4	Channel 10-11
L216	"	73D30-3	Channel 12-13
L217A	Osc. Coil	73D30-46	Channel 2
B	"		Channel 3
L218	"	73D30-15	Channel 4
L219	"	73D30-10	Channel 5
L220	"	73D30-14	Channel 6
L221	"	73D30-6	Channel 7 thru 9
L222	"	73D30-9	Channel 10-11
L223	"	73D30-1	Channel 12-13
L224	RF Choke	73D30-16	
L225	Mixer Plate	72A180	

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M201	Rotor Assy.	A5817	Complete



TUNER 94E119-6 - TOP VIEW



TUNER 94E119-6 - BOTTOM VIEW

CHASSIS REAR VIEW

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3CB6	150K	33Ω	8Ω	8.5Ω	▪ 3500Ω	▪ 3500Ω	0Ω		
V2	3DK6	.4Ω	56Ω	8.5Ω	9.5Ω	▪ 1800Ω	▪ 1800Ω	0Ω		
V3	6AW8A	0Ω	100K	† 47K	11.5Ω	10.5Ω	0Ω	4700Ω	▪ 8200Ω	▪ 5000Ω
V4	3BU8	▪ 220Ω	† 8200Ω	2meg	10.5Ω	9.5Ω	▪ 12K	† 2.2meg	† 28K	▪ 4.7meg
V5	3DT6	15.5Ω	680Ω	5.5Ω	4.5Ω	† 330K	▪ 8200Ω	560K		
V6	12CU5	¶	500K	5.5Ω	8Ω	500K	† 220Ω	† 450Ω		
V7	6CG7	● † 1.5meg	220K	● 105K	0Ω	1.5Ω	† 12K	1.4meg	3300Ω	0Ω
V8	12DB5	† 18K	● 500Ω	2.2meg	12.5Ω	15.5Ω	2.2meg	● 500Ω	NC	† 840Ω
V9	6CG7	† 10K	570K	1200Ω	1.5Ω	3Ω	† 82K	47K	1200Ω	0Ω
V10	12DQ6A 12DQ6	TP	18Ω	TP	† 12K	1meg	TP	15.5Ω	0Ω	TOP CAP ‡ 8.5Ω
V11	12AX4GTA	NC	NC	¶ 700K	NC	† 0Ω	NC	20Ω	18Ω	
V12	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡ 455Ω
V13	17BZP4	11.5Ω	39K	‡ 150K	‡ 150K	NC	NC	● 200K	12.5Ω	
V201	3BC5	4.5meg	0Ω	3Ω	3.5Ω	† 5800Ω	† 8000Ω	0Ω		
V202	5J6	▪ 18K	▪ 10K	3.5Ω	4.5Ω	230K	10K	0Ω		
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

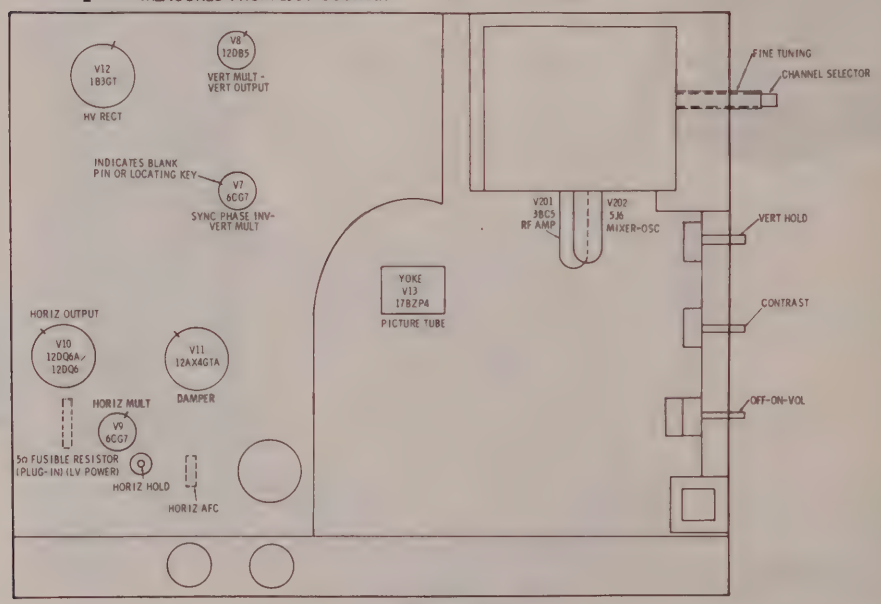
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

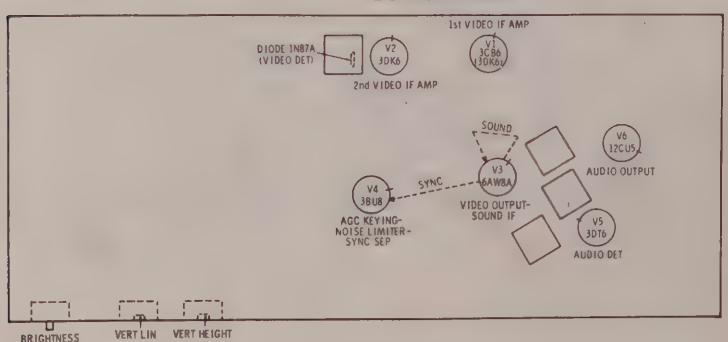
† MEASURED FROM 250V SOURCE.

‡ MEASURED FROM PIN 3 OF V11. NC NO CONNECTION.

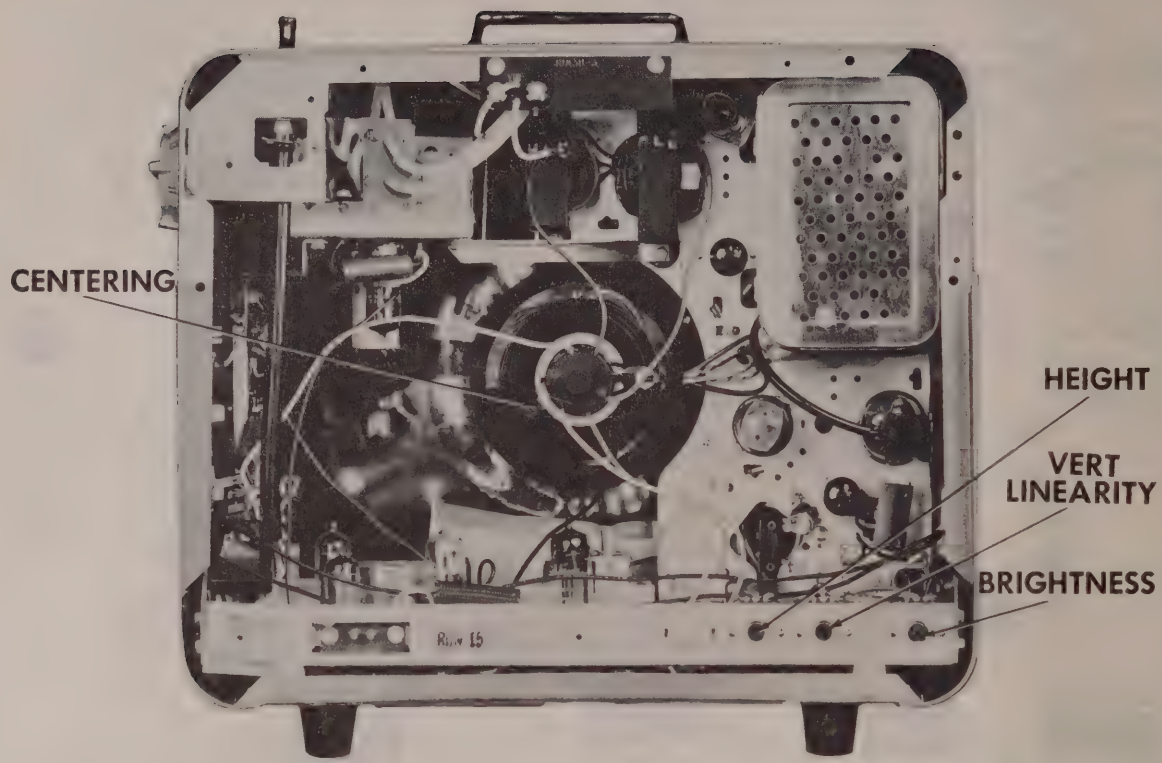
▪ MEASURED FROM 150V SOURCE. TP TIE POINT.



BOTTOM VIEW



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast for a normal picture.

Turn the Horizontal Hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.

PHOTOFACT* Folder

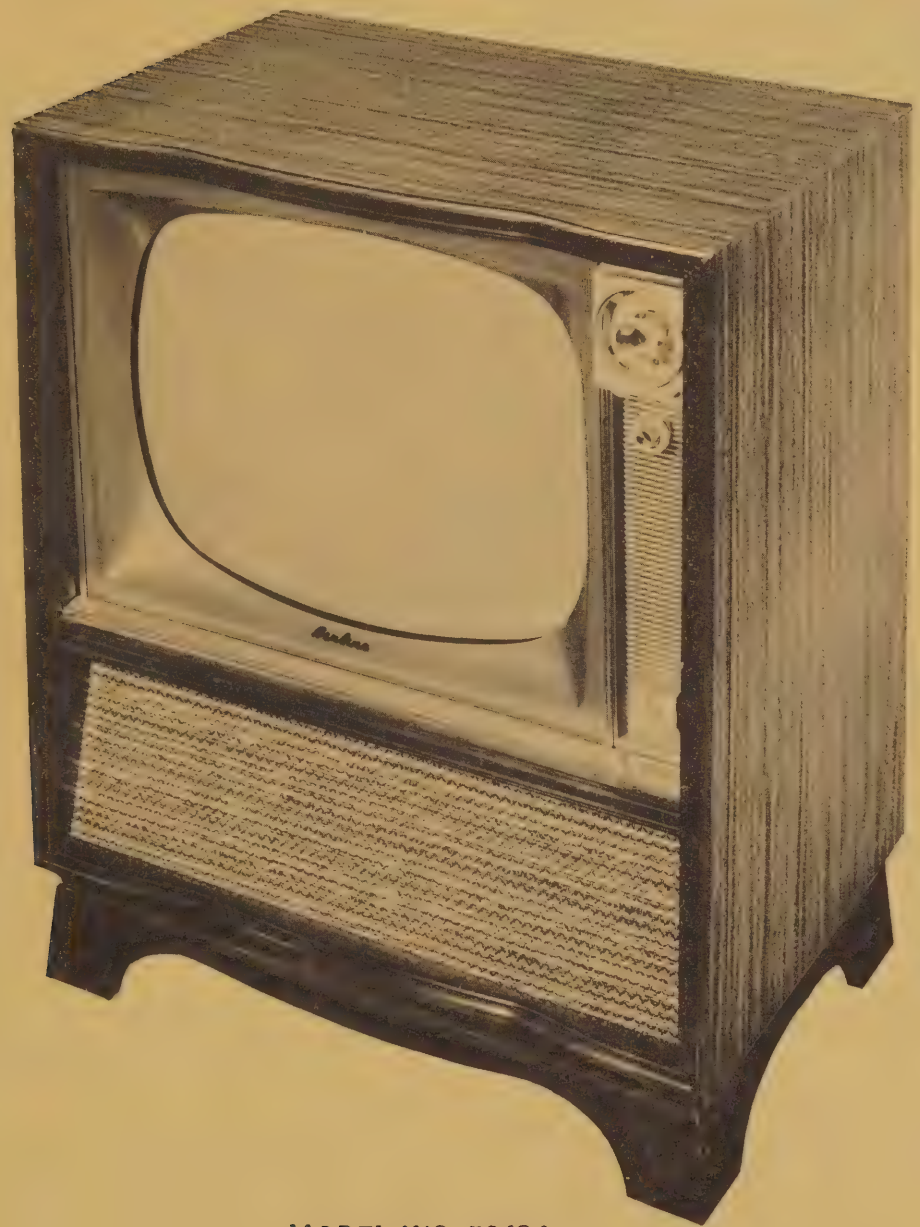
AIRLINE MODELS WG-5063A, WG-5073A, WG-5163A, WG-5173A

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

AIRLINE MODELS WG-5063A, WG-5073A, WG-5163A, WG-5173A



MODEL WG-5063A

AIRLINE MODELS WG-5063A, WG-5073A, WG-5163A, WG-5173A

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SET 424 FOLDER 2

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

AIRLINE MODELS WG-5063A, WG-5073A, WG-5163A, WG-5173A

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 5 push-on type knobs from the front and channel indicator panel.
2. Remove 5 wood and 1 metal screw holding rear cover.
3. Remove picture tube socket, yoke plug, HV and speaker leads.
4. Loosen 2 wood screws and remove antenna terminal board.
5. Remove 1 wood screw holding chassis support bracket.
6. Remove 2 wood screws holding chassis at top.
7. Remove 4 bottom chassis bolts.
8. Partially remove chassis from rear of cabinet. Remove pilot light. Remove chassis.

MODEL WG-5063A

TRADE NAME	Airline	MODELS WG-5063A, WG-5073A, WG-5163A, WG-5173A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Illinois	
TYPE SET	Television Receiver	
TUBES	Eighteen	
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 180 Watts, 1.7 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)	

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the Channel Selector and Dial Indicator panel by pulling outward. Set the Fine Tuning at the center of its range. The adjustments are accessible, one at a time, as the Channel Selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 5 wood screws holding the metal trim strip at the top edge of the Safety Glass. Tilt glass out at the top and lift up to remove.

SPECIAL ADJUSTMENTS

A. Range
Observe the picture and advance the Range control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

B. Focus
Adjust the Beam Alignment magnet on the neck of the Picture Tube for best focus.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the Horizontal Oscillator it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz control for MINIMUM buzz and maximum sound. (For location, see tube placement chart.)

FUSE

One fuse is used for low voltage supply protection. (For location, see tube placement chart.) One fuse wire is used for filament protection.

FUSE DEVICE

A Thermal Switch is used for low voltage power supply protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

AIRLINE MODELS WG-5063A, WG-5073A, WG-5163A, WG-5173A

SET 424 FOLDER 2

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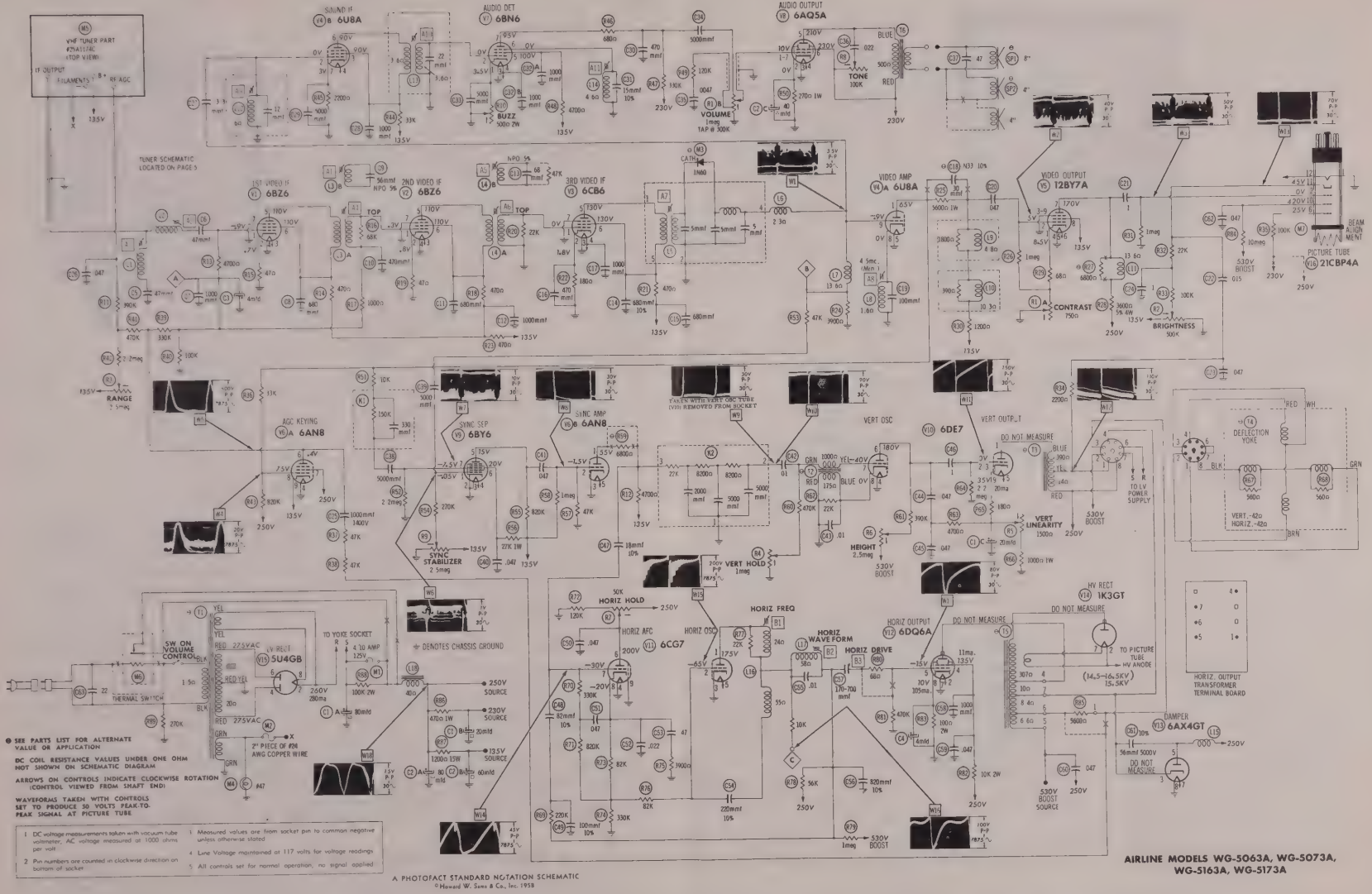

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2. Pin numbers are counted in clockwise direction on bottom of socket
3. Measured values are from socket pin to common negative unless otherwise stated
4. Line Voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation, no signal applied

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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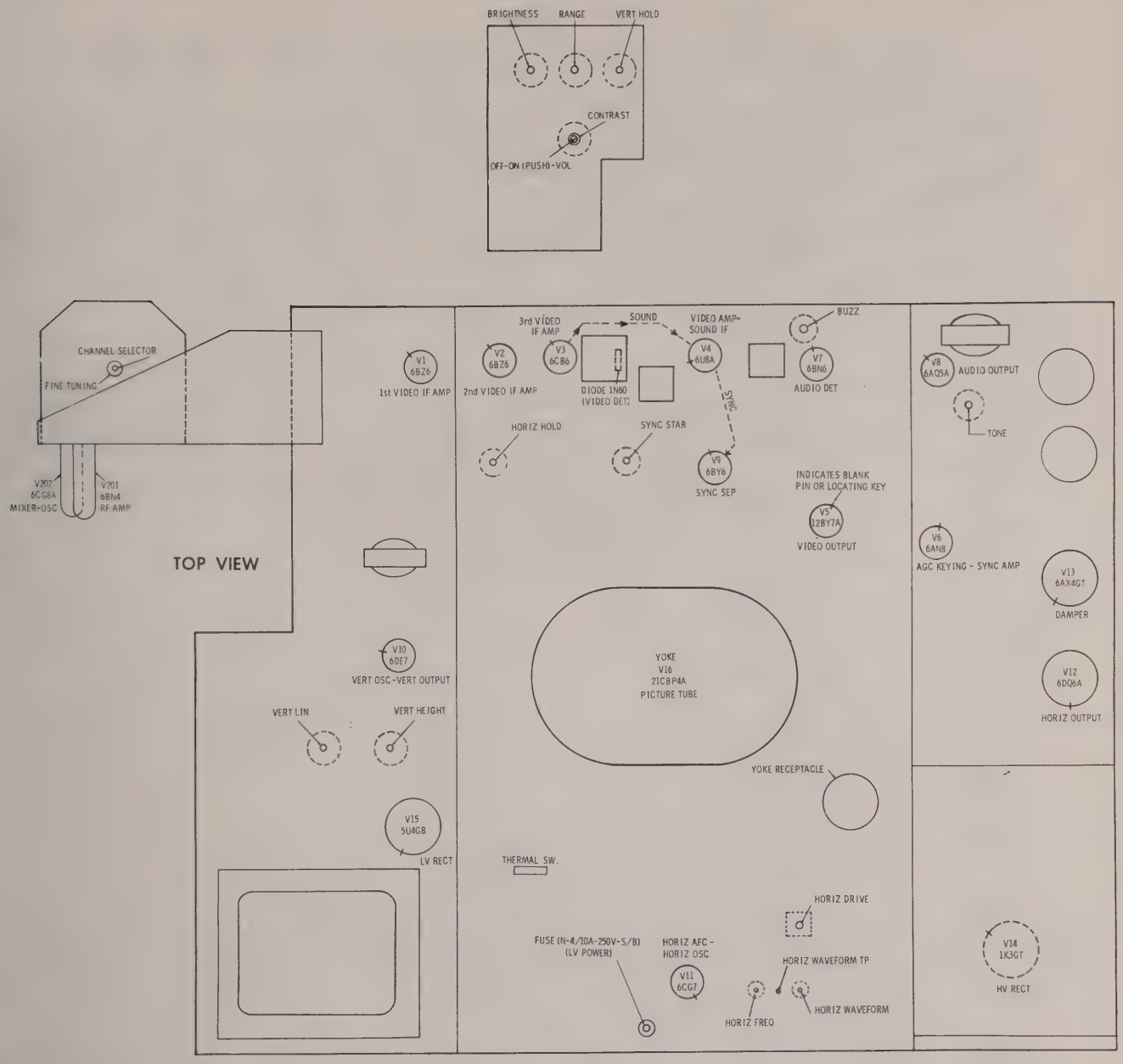
AIRLINE MODELS WG-5063A, WG-5073A, WG-5163A, WG-5173A

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

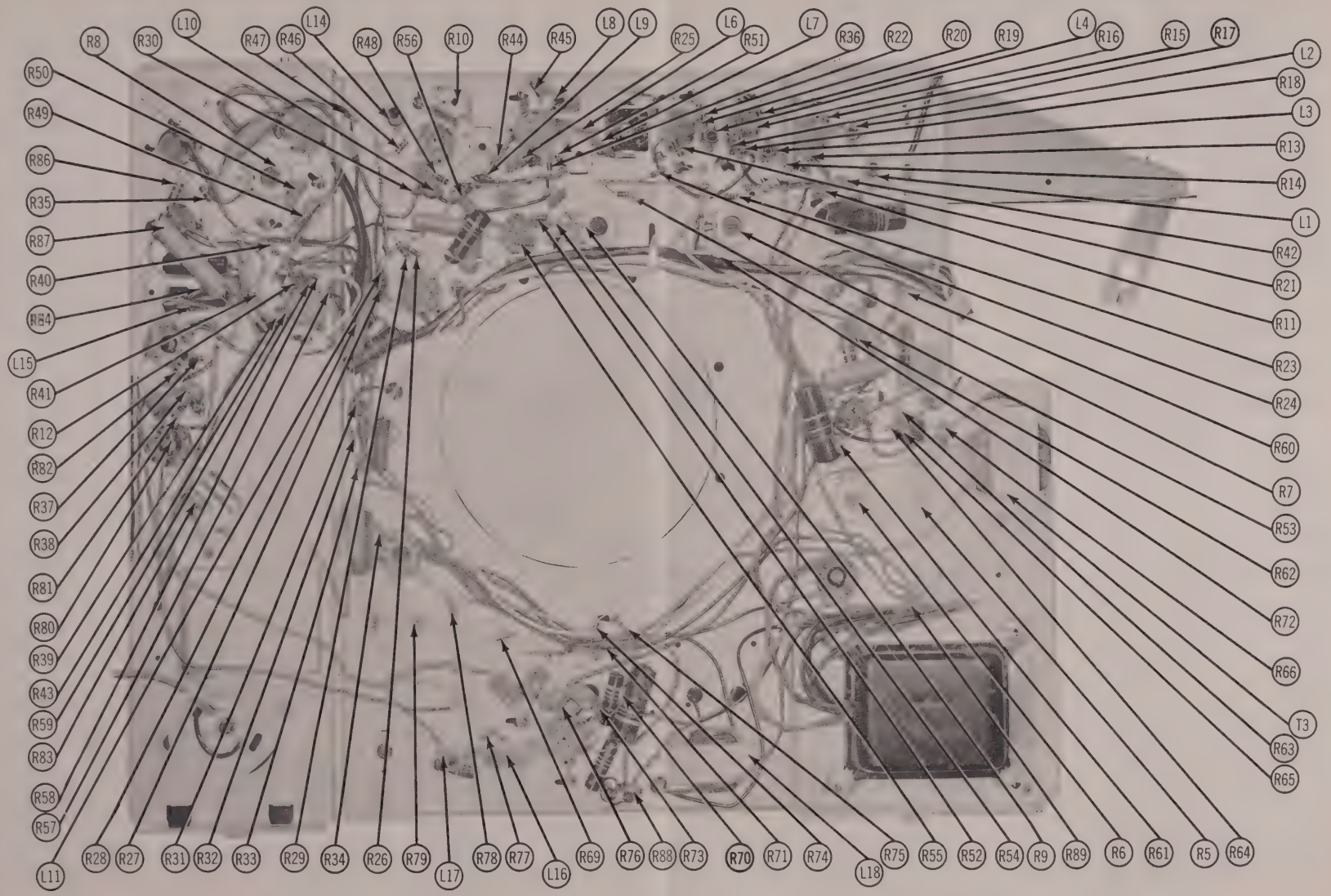
The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (B+), Thermal Switch (M6), V15

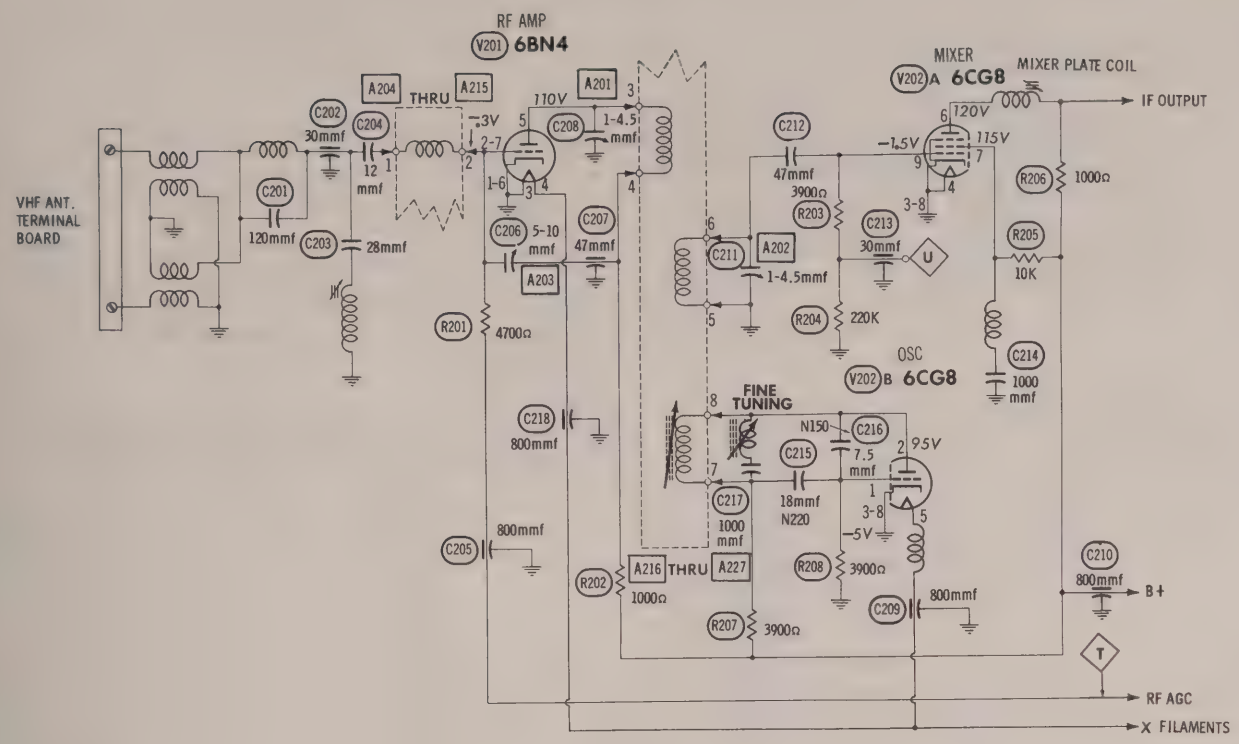
SWEEP FAILURE
No raster, has sound V11, V12, V13, V14, V16
No vertical deflection V10
Poor vert. linearity or foldover V10
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, V15
Vert. off freq. V10
Horiz. off freq. V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det)
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V5, V16
Has pic, no sound V4, V7, V8
Overloaded picture V6

SYNC FAILURE
No vert. sync V9, V6
No horiz. sync V9, V6, V11
No vert. or horiz. sync V9, V6



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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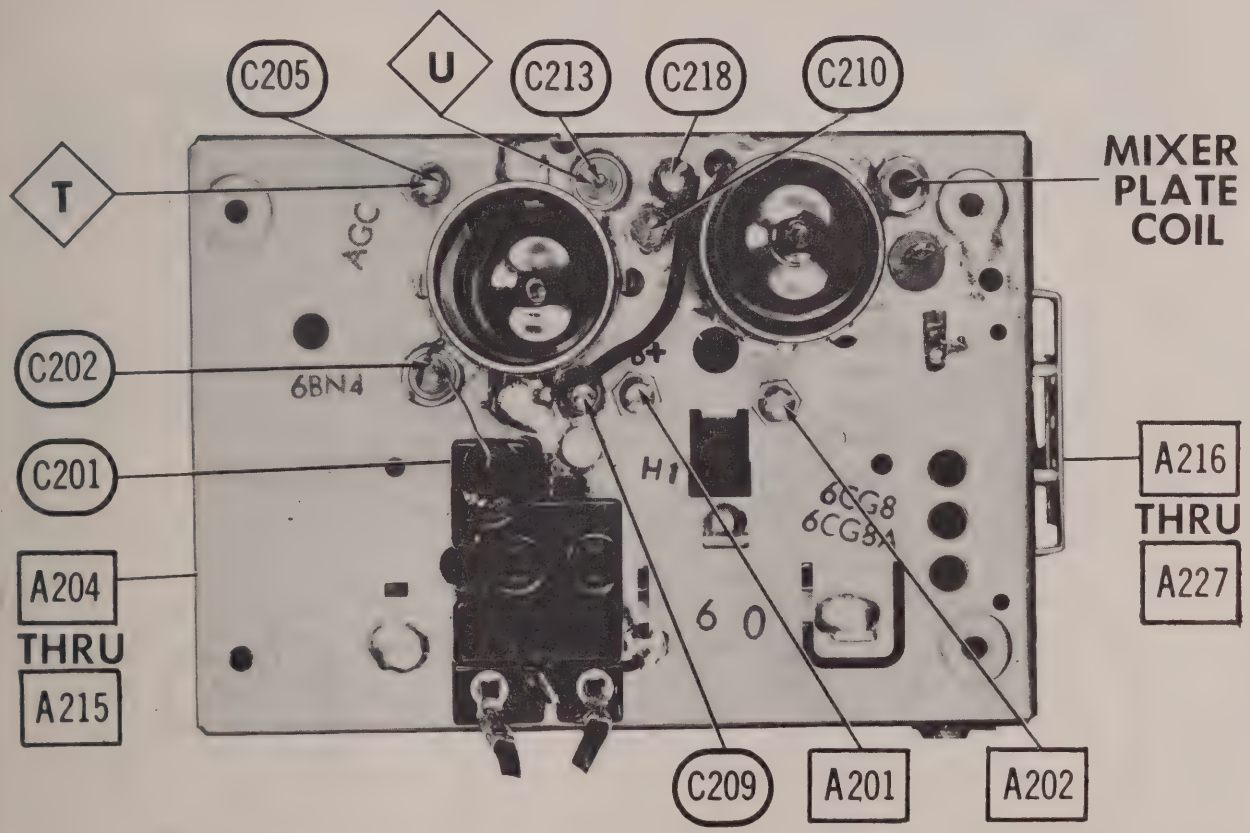
VHF TUNER 25A1174



TUNER 25A1174 - TOP VIEW

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.

RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point Ⓣ. Positive to chassis.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading. (Approximately 1.5 volts).
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A201, A202	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201.
2.	"	"	"	"	"	Vert. Amp. thru detector (Fig. 202). to plate of 1st. IF tube. Low side to chassis.	A203	Adjust A203 to obtain MINIMUM response on the scope.
3.	"	"	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

OSCILLATOR ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading. (Approximately 1.5 volts).
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across video detector load.	A216	Adjust to place sound marker in trap notch as in Fig. 203. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

FIG.201

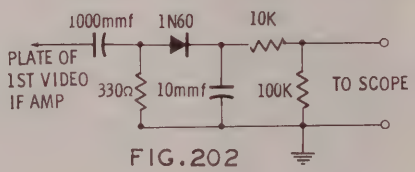


FIG.202

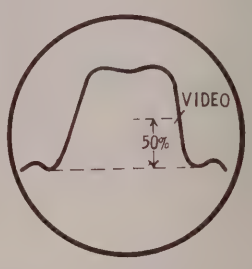


FIG.203

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: General Cement #8282, 8606, 8606L or 9295
Walsco #2543, 2544 or 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point Ⓐ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	44.0MC (10MC Swp)	47.25MC	Any non-interfering channel	Vert. Amp. thru demodulator probe (Fig. 1) to pin 5 (plate) of 6BZ6 (V1). Low side to chassis.	A1	Adjust to place marker in trap notch as in Fig. 2.
2.	"	"	"	41.25MC 45.75MC 47.25MC	"	"	A2, A3, & Mixer Plate Coil	Adjust for response similar to Fig. 2. Mixer Plate Coil and A2 affect the shape of the top. A3 is adjusted to position the 41.25MC marker. This adjustment must be made correctly or the sound rejection will not be correct. The 45.75MC marker must be exactly on peak.
3.	"	"	"	42.8MC	"	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis. DC probe of VTVM thru 10K to same point. Common to chassis. (Across Video Det. load)	A4	Increase bias at point A to 4.5 volts. Adjust sweep output for -2 volts DC at point Ⓑ. Adjust A4 for maximum amplitude at marker.
4.	"	"	"	41.25MC	"	"	A5	Adjust for MINIMUM amplitude at marker.
5.	"	"	"	45.3MC	"	"	A6	Adjust for maximum gain at marker.
6.	"	"	"	44.0MC	"	"	A7	"
7.	"	"	"	41.25MC 42.4MC 42.8MC 44.0MC 44.5MC 45.3MC 45.75MC 47.25MC	"	"		Check for response similar to Fig. 3 with markers as shown. If necessary, retouch A2 thru A7 for desired response. A7 controls the symmetry of the top. A6 controls position of the 45.75MC marker. A4 controls position of the 42.4MC marker (this slug will seldom need retouching). CAUTION : The position of 44.5MC marker is very critical (98%).

4.5MC TRAP ALIGNMENT

Use 0-10 volts AC scale on VTVM.
Set Contrast fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.005mfd	High side to pin 9 (grid) of 6U8 (V4). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	RF probe to pin 11 (cathode) of picture tube. Common to chassis.	A8	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune in a TV signal and reduce signal level at the antenna terminals, by use of an attenuator or similar device, until a hiss similar to super-regeneration is heard in the sound.
Adjust A9, A10 and A11 for maximum undistorted sound.
Adjust the Buzz control (R10) for MINIMUM buzz.

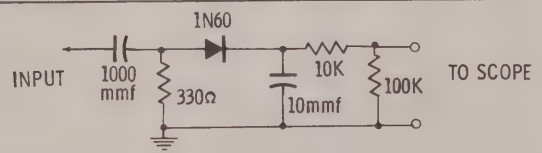


FIG. 1

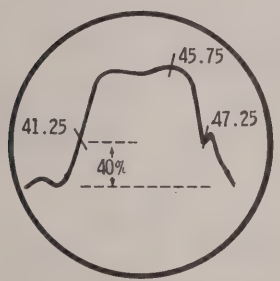


FIG. 2

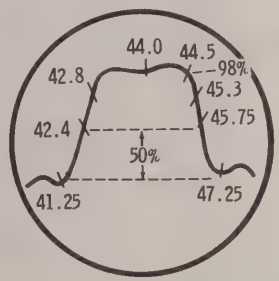


FIG. 3

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st. Video IF Amp.	6BZ6	
V2	2nd Video IF Amp.	6BZ6	
V3	3rd. Video IF Amp.	6CB6	
V4	Video Amp. -Sound IF Amp.	6U8A	
V5	Video Output	12BY7A	
V6	AGC Keying-Sync Amp.	6AN8	
V7	Audio Det.	6BN6	
V8	Audio Output	6AQ5A	
V9	Sync Sep	6BY8	
V10	Vert Osc -Vert Output	6DE7	
V11	Horiz. AFC-Horiz. Osc.	6CG7	
V12	Horiz. Output	6DQ6A	
V13	Damper	6AX4GT	
V14	HV Rect.	1B3GT	
V15	LV Rect.	6U4GB	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	AIRLINE PART No	GENERAL ELECTRIC PART No	RCA PART No	SYLVANIA PART No	
V16	21CBP4A		21CBP4-A ①	21CBP4; 21CBP4A ②	① "Silverama" ③ ② "Silver Screen 86"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	PYRAMID PART No	SANGAMO PART No.	SPRAGUE PART No.
C1A	⌀80	300	45X428	AFH4-07	C0239	FP333. 8 TT50X10	TMQ-167	T-525 MT-0510	TVL8-3573.7
B	⌀20	300							
C	⌀20	50							
C2A	⌀80	300	45X429	AFH3-29-50	C0194 BR2035			Q-187.5	TVL8-3573.9
B	⌀60	300							
C	⌀40	50							
C3	4	50	45X418	PRS150V4	BBR4-50	TT50X5	TD-4-50	MT-0504	TVA-1402
C4	4	50	45X418	PRS150V4	BBR4-50	TT50X5	TD-4-50	MT-0504	TVA-1402

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA AIRLINE PART No	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	47			SM 47	DS-470	CL7EQ47	UC-5447	5GA-Q47	
C6	47			SM 47	DS-470	CL7EQ47	UC-5447	5GA-Q47	
C7	1000			BPD-001	DD-102	BYA81A	DC531	5HK-D1	
C8	680			BPD-00068	DD-681	BYA101T68	UC-5368	5GA-T68	
C9	56								NPO 5%
C10	470			BPD-00047	DD-471	BYA101T47	UC-5347	5GA-T47	
C11	680			BPD-00068	DD-681	BYA101T68	UC-5368	5GA-T68	
C12	1000			BPD-001	DD-102	BYA81A	DC531	5HK-D1	
C13	68								NPO 5%
C14	680				DD-681	1R5T68		MS-368	10%
C15	680			BPD-00068	DD-681	BYA101T68	UC-5368	5GA-T68	
C16	470			BPD-00047	DD-471	BYA101T47	UC-5347	5GA-T47	
C17	1000			BPD-001	DD-102	BYA81A	DC521	5HK-D1	
C18	30								N33 10% ①
C19	100			SM 100	DS-101	LT5T1	UC-531	5GA-T1	
C20	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	47M-S47	
C21	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	47M-P1	
C22	.015	600		P668N-015	DF-153	CUB6S15	GEM-6115	47M-S15	
C23	.047	500		P588N-047	DF-503	CUB5S47	GEM-5147	47M-S47	
C24	.1	200		P288N-1	DF-104	CUB2P1	GEM-201	47M-P1	
C25	1000	1400		DAC-2	DC30-102	BYH21A		BL-D2	
C26	.047	200		P288N-047	DF-503	CUB2S47	GEM-4147	47M-S47	
C27	3 3			NPO-SI 3 3	TCZ-3R3	CTA5V33C	ZT-5533	5TCCB-V33	
C28	100			BPD-001	DD-101	BYA81A	DC531	5HK-D1	
C29	5000			BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C30	470			BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C31	15			NPO-DI 15	DD-150	L0QS3		5TCC-S15	10%
C32A	1000			BPD-2X001	DD2-102	BYC5DD1	DCD521	5HK-R2I	
B	1000								
C33	5000			BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C34	5000			BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C35	.0047	400		P488N-0047	DS-472	CUB5D47	GEM-6247	47M-D47	
C36	.022	600		P668N-022	DD-203	CUB6S22	GEM-6123	47M-D22	
C37	47	200		P288N-47		CUB2P47	GEM-2047	47M-P47	
C38	5000			BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C39	5000			BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C40	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	47M-S47	
C41	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	47M-S47	
C42	.01	600		P668N-01	DS-103	CUB6S1	GEM-611	47M-S1	
C43	.01	600		P668N-01	DS-103	CUB6S1	GEM-611	47M-S1	
C44	.047	600		P668N-047	DF-503	CUB6S47	GEM-6147	47M-S47	
C45	.047	600		P668N-047	DF-503	CUB6S47	GEM-6147	47M-S47	
C46	.1	600		P668N-1	DF-103	CUB6P1	GEM-601	47M-P1	
C47	18		RCM20B180K	1469-00018	DS-180	2ZR5Q18		MS-418	10%
C48	82			1469-00082	DS-820	2ZR5Q82		MS-482	10%
C49	100			1469-0001	DS-101	2ZR5T1	MCB235	MS-31	10%
C50	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	47M-S47	
C51	.047	200		P288N-047	DF-503	CUB2S47	GEM-2147	47M-S47	
C52	.022	200		P288N-022	DD-203	CUB2S22	GEM-4123	47M-S22	
C53	47	200		P288N-47		CUB2P47	GEM-2047	47M-P47	
C54	220			1469-00022	DS-221	2RS7T22		MS-322	10%
C55	.01	400		P488N-01	DS-103	CUB4S1	GEM-411	47M-S1	
C56	820			1464-00082		1R5T82		MS-382	10%
C57	470-700		17A271						
C58	1000			BPD-001	DD-103	BYA8D1	DC521	5HK-D1	
C59	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	47M-S47	
C60	.047	600		P668N-047	DF-503	CUB6S47	GEM-6147	47M-S47	
C61	56	5000	4TX756						10%
C62	.047	600		P668N-047	DF-503	CUB6S47	GEM-6147	47M-S47	
C63	.22	600		P668N-22		CUB4P22	GEM-6022	47M-P22	

① Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA AIRLINE PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	INSTALLATION NOTES
R1A	750Ω	½	76X32					Contrast
B	1meg	½						Volume, Tap ⓐ 300K
C	Switch							Push-Push Type
R2A	500K	½	40X447	AB-S9	A47-500K-S	QU-133	U50	Brightness
B	Shaft			AK-S †	RS-3/16	NQ	D8-37	
R3A	2.5meg	½	40X448	AB-S3	A47-2.5meg -S	QU-339	U258	Range
B	Shaft			AK-S †	RS-3/16	NQ	D8-37	
R4A	1meg	½	40X446	AB-S9	A47-1meg-S	QU-137	U54	Vert. Hold
B	Shaft			AK-S †	RS-3/16	NQ	D8-37	
R5A	15000	½	40X454	AB-S6	B47-1500-S	BU-109	PTA152L	Vert. Lin.
B	Shaft			AK-1	Not Req.	TM3	Not Req.	
R6A	2.5meg	½	40X453	AB-S3	B47-2.5meg -S	BU-339	TA335L	Height
B	Shaft			AK-1	Not Req.	TM3	Not Req.	
R7A	50K	½	40X449	AB-S1	B47-50K-S	BU-123	PTA54L	Horiz. Hold
B	Shaft			AK-1	Not Req.	TM3	Not Req.	
R8A	100K	½	40X407	AB-4O	B47-100K-S	BU-138	TA15L	Tone
B	Shaft			AK-1	Not Req.	TM3	Not Req.	
R9A	2.5meg	½	40X398	AB-S3	B47-2.5meg -S	BU-339	PTA35L	Sync - Stab
B	Shaft			AK-19	Not Req.	TM3	Not Req.	
R10	500Ω	2(WW)	40X397		39-500		FL-500	Buzz

† File shaft flat as required.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	AIRLINE PART No	NOTES
R11	390K			
R12	4700Ω			
R13	4700Ω			
R14	470Ω			
R15	47Ω			
R16	68K			
R17	1000Ω			
R18	470Ω			
R19	47Ω			
R20	22K			
R21	4700			
R22	180Ω			
R23	470Ω			
R24	3900Ω			
R25	5600Ω	1		
R26	1meg			
R27	6800Ω			①
R28	3600Ω 5%	4	43X331	
R29	68Ω			
R30	1200Ω			
R31	1meg			
R32	22K			
R33	100K			
R34	2200Ω			
R35	100K			
R36	33K			
R37	47K			
R38	47K			
R39	330K			
R40	100K			
R41	470K			
R42	2.2meg			
R43	820K			
R44	33K			
R45	2200Ω			
R46	680Ω			
R47	330K			
R48	4700Ω			
R49	120K			
R50	270Ω	1		

ITEM No.	RATING OHMS	RATING WATT	AIRLINE PART No	NOTES
R51	10K			
R52	2.2meg			
R53	47K			
R54	270K			
R55	820K			
R56	27K	1		
R57	47K			
R58	1meg			
R59	6800Ω			①
R60	470K			
R61	390K			
R62	22K			
R63	4700Ω			
R64	2.2meg			
R65	180Ω			
R66	1000Ω	1		
R67	560Ω			
R68	560Ω			
R69	330K			
R70	330K			
R71	820K			
R72	180K			
R73	33K			
R74	330K			
R75	3900Ω			
R76	33K			
R77	22K			
R78	56K			
R79	1meg			
R80	68Ω			
R81	470K			
R82	10K	2		
R83	100Ω	2		
R84	10meg			
R85	5600Ω			
R86	470Ω	1		
R87	1200Ω	15		
R88	100K	2	D85104	
R89	270K		B34274	

① Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA AIRLINE PART No	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No	NOTES
L1	39MC Trap	9A2369			4202		
L2	1st. Video IF	9A2365	17-4534	TV-131	4202	RF-4	
L3A	2nd. Video IF	9A2363	17-4536		6222		
B	47.25MC Trap						
L4A	3rd. Video IF	9A2414	17-4535		6221		
B	41.25MC Trap						
L5	4th. Video IF	9A2370					Includes Caps & 30 Microhenry Choke
L6	Resonant Choke	9A2375					30 Microhenries
L7	Shunt Peaking Coil	36A2	19-3180	TV-184	6180	VP-5	180 Microhenries
L8	4.5MC Trap	9A2413	17-3400	TV-181		SF-3	
L9	Shunt Peaking Coil	36A42					30 Microhenries, wound on 1800Ω resistor
L10	Shunt Peaking Coil	36A61	19-3100 *	TV-194 *	6112 *		100 Microhenries, wound on 390Ω resistor
L11	Shunt Peaking Coil	36A2	19-3180	TV-184	6180	VP-5	180 Microhenries
L12	1st. Sound IF	9A2364	17-1026				
L13	2nd. Sound IF	9A2368	17-3495	TV-113	6203	SF-2	
L14	Quadrature Coil	9A2367	20-1005	TV-131	1482		
L15	RF Choke	9A2380	19-1001	BC-562	4804		1.5 Microhenries

* Parallel with 3900Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA AIRLINE PART No	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No	Thordarson PART No	NOTES
L16	79Ω		9A2371		TV-185	6211 *		HS-7	Horiz. Freq Tapped @ 55Ω
L17	58Ω		9A2372			6313		HS-5 *	Horiz. Waveform
									* Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA AIRLINE PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
L18	280A	40Ω	1 Hy.	52X95-10	C5037 ①	C-2991 ①		C-2326 ①	26C43 ①	C-27X

① Drill new mounting hole.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	117V ② 1.7A	500VCT ② .280A	5V ② 3A	53X369A 53X354 ②		F-2830 P-2830		P-8333 ① P-8332 ①	26R88 26R68	R-64BC R-64BC
	SEC. 3	SEC. 4	SEC. 5							
	6.3V & 5 5A									

① Parallel and phase 6.3V windings. ③ Alternate Part Number.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T2	Vert. Osc.	54X19-A	B6702	A-3003	V405		A-8125	26A03	A-97X
	Alt. Vert. Osc.	54X19							
T3	Vert. Output	51X186-2B	Z1900 ①②	A-3036 ①③	V307 ①③		VO-100 ②	26S73 ③	A-118X ③
	Alt. Vert. Output	51X186-2							
T4	Yoke-Horiz. (24MH) (90°)-Vert. (39MH)	C9A2403	DF607 ③ ⑤	MDF-92 ④ ⑤	T90F10/43 ③ ⑤		DY-16A ④ ⑤	Y-45 ④ ⑤	Y-45 & NW2I ⑤
	Alt. Yoke	9A3403							
	Rear Cover & Centering Device	2A436							YC-1 & CL-1
	Yoke Clamp	30X611							
T5	Horiz. Output	53X362C	FB486 ③ * ‖	HVO-157 ③ * ‖	X174	EFH188 ③ ⑤ * ‖	HO-38 ③ * ‖	FLY-143 ③ * ‖	D-123 * ‖
	Alt. Horiz. Output	53X362							

① Connect as autoformer.
② Use 9 : 1 turns ratio.
③ Drill new mounting hole(s).
④ Use original rear cover & centering device. Use original damping network.
⑤ Connect same as original.
⑥ Trim 1 1/2" from top of terminal board.
‖ This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	4	5	5		5	8	5	P
	7	2	2		2	3	2	3
	6	6	6		6	2	6	2
	5	1	1		1	1	1	1
Special Notes →		⑦	⑦		⑦		⑦	

⑦ Remove one turn from filament winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No	Triad PART No.	NOTES
T6	4700Ω	3-4Ω	51X176	Z1006	A-2930	AU-604 ①	A-3877	26S49 ①	S-52 ①	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA AIRLINE PART No.	QUAM PART No.	NOTES
SP1	8"	PM	3-4Ω	12A548 ①	8A21	① Used in Console Models.
	4" x 6"	PM	3-4Ω	12A531 ③	46A1	② Used in Table Models.
SP2	4"	PM	3-4Ω	21A547 ②	4A07	③ Alternate 4" speaker used in Console Models
	4"	PM	3-4Ω	12A543 ③		

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AIRLINE PART No.	REPLACEMENT DATA	
X1	Sync Coupling Circuit	330mmf, 150K	76X15	Sprague	PRC-5
X2	Vert. Integrator	3000mmf, 5000mmf, 5000mmf, 22K, 8200Ω, 8200Ω	76X7	Aerovox	PA-110
				Centralab	PC-104
				Cornell-Dubilier	1ST2M1
				Sprague	V1/V3

AIRLINE MODELS WG-5063A, WG-5073A, WG-5163A, WG-5173A

FOLDER 2

TUNER PARTS LIST AND DESCRIPTIONS

25A1174

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	6BN4	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6CG8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

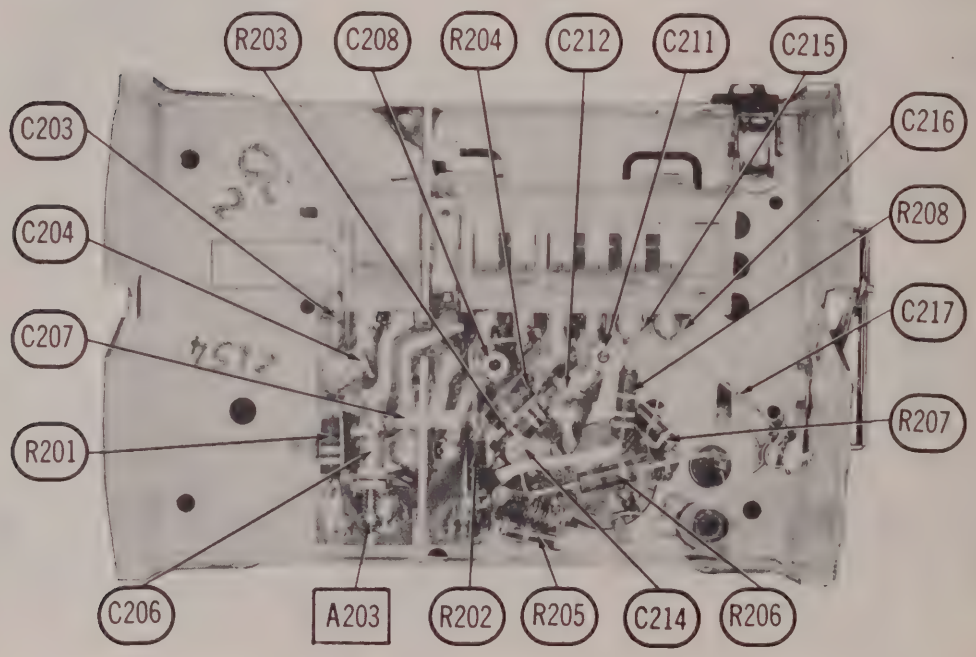
ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	120			BPD-00012	DD-121	L10T12	UC-5312	5GA-T12	
C202	30								
C203	28								
C204	12								
C205	800								
C206	5-10								
C207	47								
C208	1-4.5								
C209	800								
C210	800								
C211	1-4.5								
C212	47								
C213	30								
C214	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C215	18								N220
C216	7.5								N150
C217	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C218	800								

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		AIRLINE PART No.	NOTES
	OHMS	WATT		
R201	4700Ω			
R202	1000Ω			
R203	3900Ω			
R204	220K			

ITEM No.	RATING		AIRLINE PART No.	NOTES
	OHMS	WATT		
R205	10K			
R206	1000Ω			
R207	3900Ω			
R208	3900Ω			



TUNER 25A1174 BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AIRLINE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	N	4/10A 125V S/B	16X162	16X163	333.400 (N 4/10A-125V-S/B)	346009	N 4/10	HN 3/10 to 1/2
M2	#24 AWG Copper Wire 2" Length							

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		AIRLINE PART No.	CBS PART No.	SYLVANIA PART No.	
M3	1N60 *		1N60	1N295	Video Detector (Pigtail) * Some versions may use a CK706A in this application.

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M4	Lamp		#47
M5	Tuner	25A1174	VHF
M6	Thermal Switch	2A495	
M7	Magnet	2A476	Beam Alignment

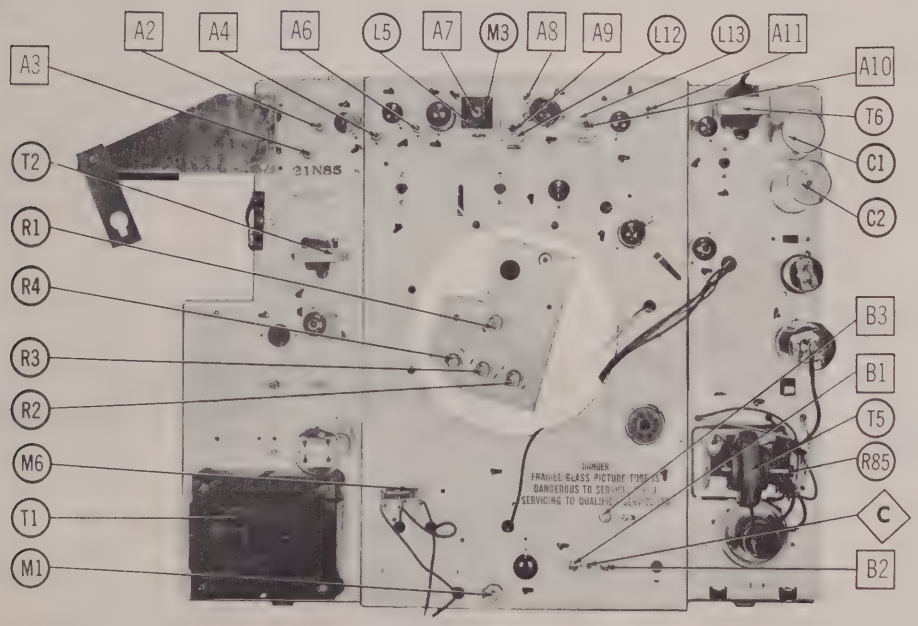
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

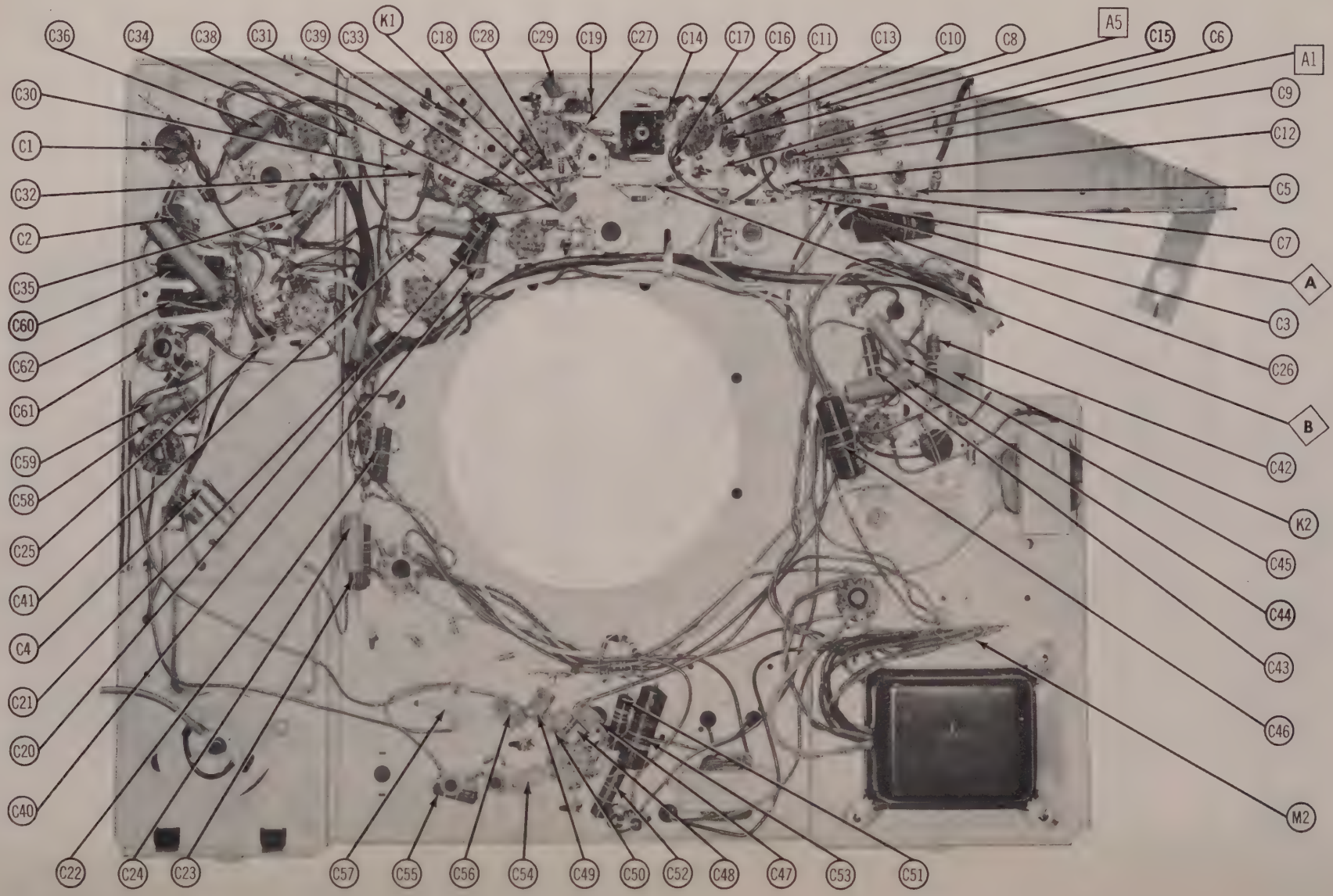
NAME	PART NO.	DESCRIPTION
Safety Glass	17X199-1	
Knob	10A943-1	Channel Selector
Knob	10A945-1	Fine Tuning
Knob	10A933-1	Contrast
Knob	10A932-1	Volume
Knob	10A944-1	Brightness, Range, Vert. Hold

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	100K	47Ω	.1Ω	0Ω	†2100Ω	†2100Ω	0Ω		
V2	6BZ6	100K	47Ω	.1Ω	0Ω	†2100Ω	†2100Ω	0Ω		
V3	6CB6	.1Ω	180Ω	0Ω	.1Ω	†1700Ω	†1700Ω	0Ω		
V4	6U8A	†8000Ω	6Ω	†34K	.1Ω	0Ω	†34K	2200Ω	1.6Ω	3900Ω
V5	12BY7A	• 310Ω	1meg	0Ω	0Ω	0Ω	.1Ω	†3600Ω	†1200Ω	0Ω
V6	6AN8	†12K	47K	0Ω	0Ω	.1Ω	360K	†0Ω	†35K	†1200Ω
V7	6BN6	•330Ω	3.6Ω	0Ω	.1Ω	†5900Ω	4.6Ω	†330K		
V8	6AQ5A	0Ω	270Ω	0Ω	.1Ω	†970Ω	†470Ω	0Ω		
V9	6BY6	• 500K	0Ω	0Ω	.1Ω	†820K	†28K	2.2meg		
V10	6DE7	†400Ω	2.2meg	2.2meg	0Ω	.1Ω	• ‡1.6meg	• 850K	175Ω	•1700Ω
V11	6CG7	†56K	310K	0Ω	0Ω	.1Ω	•†23K	1.5meg	310K	0Ω
V12	6DQ6A	TP	.1Ω	NC	†10K	470K	TP	0Ω	100Ω	TOP CAP ‡10Ω
V13	6AX4GT	TP	NC	¶1.1meg	NC	†.1Ω	TP	.1Ω	0Ω	
V14	1K3GT		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP ‡317Ω
V15	5U4GB	NC	¶	NC	20Ω	NC	22Ω	NC	¶	
V16	21CBP4A	0Ω	1meg	Pin 6 †100K	Pin 10 ‡10meg	Pin 11 • 180K	Pin 12 .1Ω			
V201	6BN4	0Ω	1.1Meg	0Ω	.1Ω	†2200Ω	0Ω	1.1meg		
V202	6CG8	3900Ω	†5100Ω	0Ω	0Ω	.1Ω	†2200Ω	†11K	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

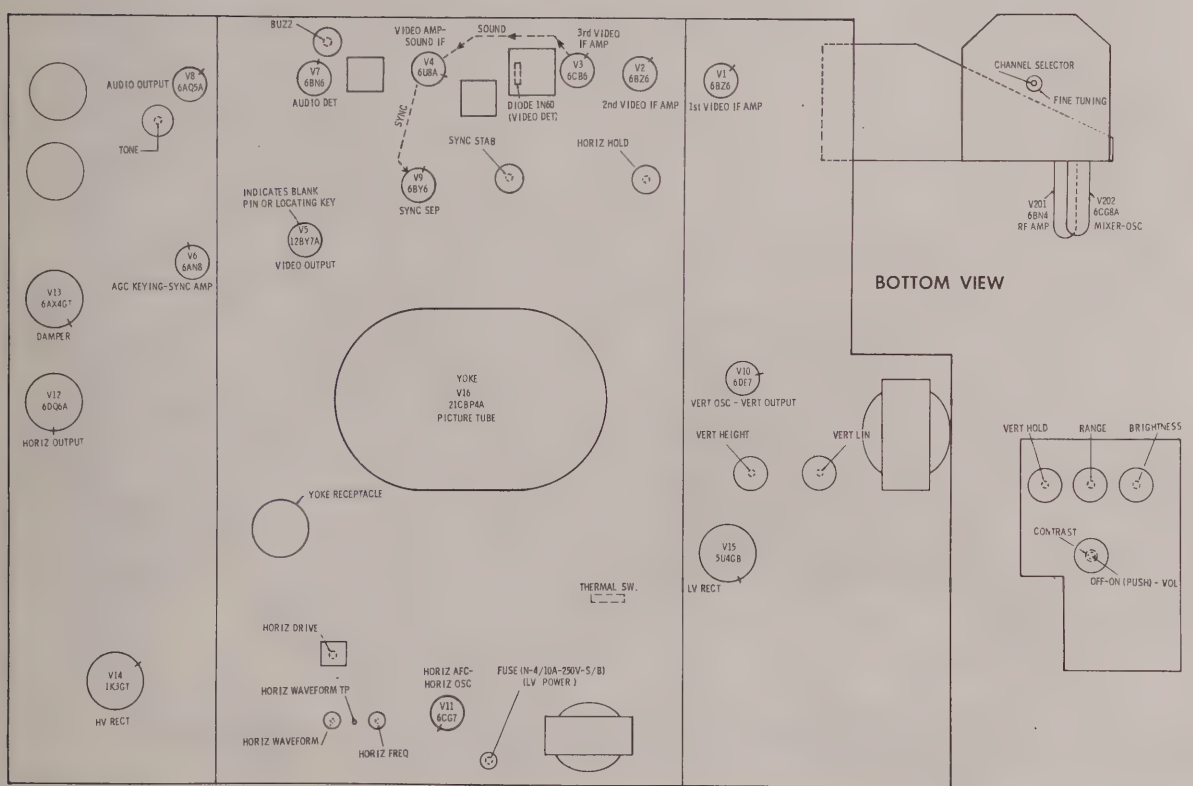
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR

• CONNECTED IN THE ASSOCIATED CIRCUIT.

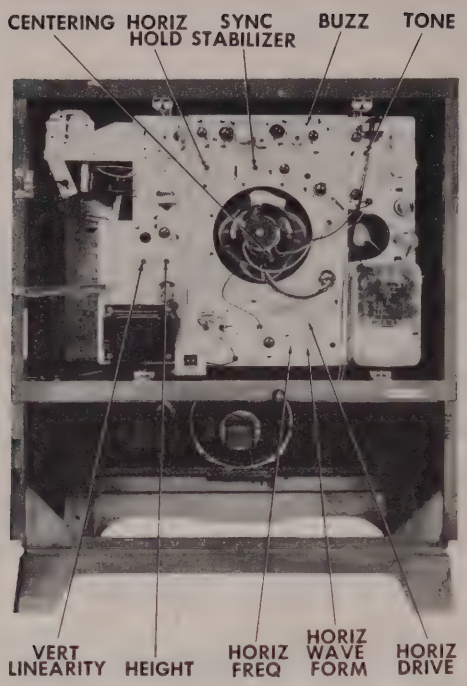
THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

† MEASURED FROM 250V SOURCE. NC NO CONNECTION.

‡ MEASURED FROM PIN 3 OF V13. TP TIE POINT.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Suggested alignment tools: General Cement #8279, 9050L or 9150
Walsco #2521 or 2524

Turn the set on and tune in a TV station, preferably with a test pattern.

Turn the Horizontal Hold control to the center of its range.

Connect a clip lead across the Horizontal Waveform coil (L17). Adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally.

Remove the clip lead from L17. Connect the vertical amplifier of a scope thru a low capacity probe to point ◇. Low side to chassis.

Adjust the Horizontal Waveform slug (B2) for equal amplitudes of the round and sharp peaks of the waveform as shown in Fig.4. While making this adjustment, keep the picture in sync with the Horizontal Hold control and B1.

Turn the Horizontal Drive trimmer (B3) clockwise as far as possible without the presence of vertical white lines or compression near the center of the raster.

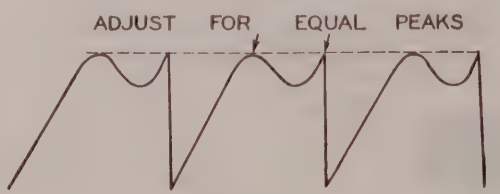
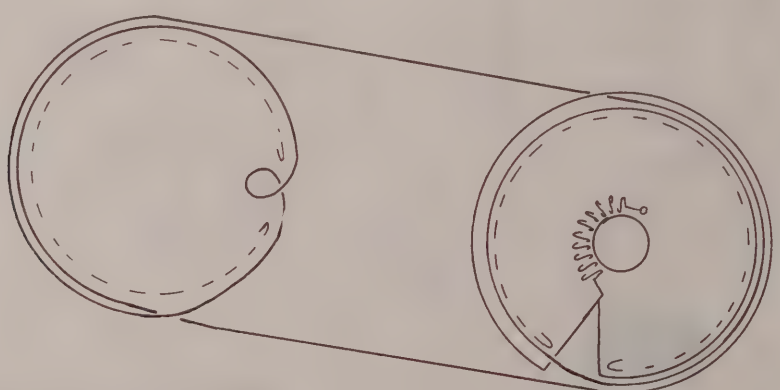


FIG. 4



FINE TUNING DRIVE CORD STRINGING

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

BELL SOUND MODEL 2360

BELL SOUND
MODEL 2360

BELL SOUND
MODEL 2360

TRADE NAME	Bell Sound Model 2360
MANUFACTURER	Bell Sound Systems, Inc., 555 Marion Road, Columbus 7, Ohio
TYPE SET	AC Operated 50 Watt 8 Channel Audio Amplifier
TUBES (Seven)	Types 12AX7/ECC83 Phono Preamplifier, 12AV6 Cath. Follower, 12AX7/ECC83 AF Amplifier, 6AN8 AF Amp.-Phase Inv., (2) 6CA7/EL34 Output, 5AR4/GZ34 Rectifier
POWER SUPPLY	110-125 Volts AC-60 Cycles RATING 1.6 Amp. @ 117 Volts AC (150 Watts)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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SET 424 FOLDER 3

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Phono Preamplifier	ECC83/12AX7
V2	Cathode Follower	12AV6
V3	AF Amplifier	ECC83/12AX7
V4	AF Amp. -Phase Inv.	6AN8

ITEM No.	USE	TYPE
V5	Output	EL34/6CA7
V6	Output	EL34/6CA7
V7	Rectifier	GZ34/5AR4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Bell Sound PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▰20	500	23B5	AFH4-95	B0500				R2703 *
B	■20	500			BR2050				
C	▲20	500							
C2A	▰20	500	23B11	AFH4-95	B0500				R2703 *
B	■20	500			BR2050				
C	▲20	500							
C3A	▰20	450	23B11	AFH3-36	C0270	FP376.5	TMT-34	T-140	TVL-3780
B	▲20	450							
C	■20	450							
C4	150	150	①	PRS150V150	BR15015	TC495	TD-150-150	MT-15150	TVA-1422
C5	150	150	①	PRS150V150	BR15015	TC495	TD-150-150	MT-15150	TVA-1422

① C4 and C5 may be a dual unit (common positive) in some versions (Part #23B10).
* Not normally in distributors stock. Available through distributor on order to manufacturer.

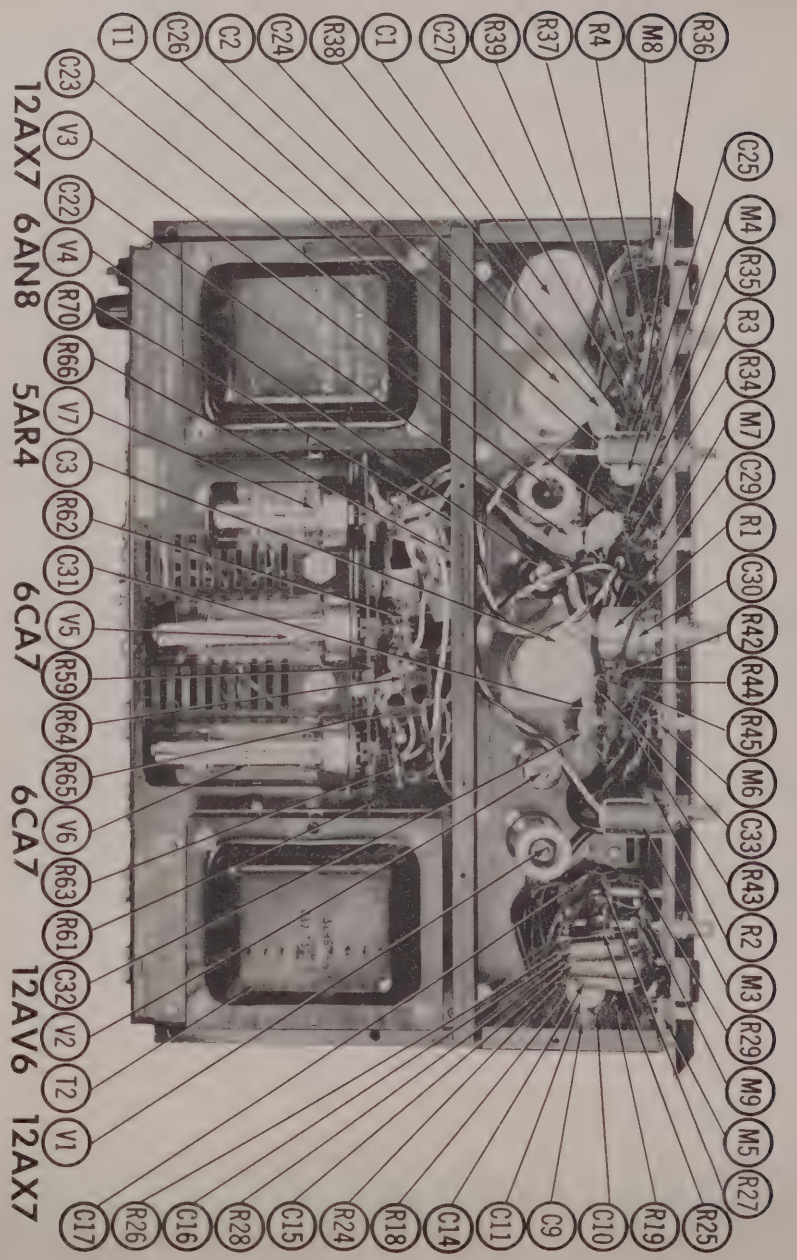
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Bell Sound PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	47			NPO-DI 47	DTZ-47	C10Q47C		5TCC-Q47	NPO 10%
C7	27				TCZ-27	C10Q27C			NPO 10%
C8	75								N470 10%
C9	.01	400					GEM-1611		10%
C10	800					1R5T8		MS-38	10%
C11	3900					1R5D39		MS-239	10%
C12	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C13	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C14	.01	400					GEM-1611		10%
C15	.04	200							10%
C16	.01	400					GEM-1611		10%
C17	3000					1R5D3	MCB461	MS-23	10%
C18	.1	200		P488N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C19	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C20	.05	400		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C21	.1	200		P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C22	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C23	5000					1R5D5	MCB465	MS-25	10%
C24	100			NPO-DI 100	DTZ-100	C10T1C	ZT-531	5TCC-T1	NPO 10%
C25	3000					1R5D3	MCB461	MS-23	10%
C26	3000					1R5D3	MCB461	MS-23	10%
C27	470				D6-471	1R5D47		MS-347	10%
C28	.05	200		P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	①
C29	470				D6-471	1R5T47		MS-347	10%
C30	470				D6-471	1R5T47		MS-347	10%
C31	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C32	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C33	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C34	.02	200		P288N-02	DD-203	CUB4S2	GEM-412	2TM-S2	①
C35	330				D6-331	L10T33		MS-333	10% ②
C36	.1	200		P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C37	100			N750-DI 100	DTN-100	C10T1U	NT-531	5TCU-T1	N750 ③
C38	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	④
C39	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	④
C40	.05	400		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	

① Some versions may use .1mfd in this application.
② Some versions may use 10mmf in this application.
③ Not used in some versions.
④ Some versions may use .5mfd in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Bell Sound PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	250K	½	B-20066P164					Loudness, Taps @ 100K & 150K
B	Switch							Push-Pull (Power On-Off)
R2A	250K	½	B-20066P162	B-50	A47-250K-S	Q11-130	U46	Level
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1meg	½	15B1	B-69	A47-1meg-S	Q11-137	U54	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	1meg	½	15B1	B-69	A47-1meg-S	Q11-137	U54	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	100Ω	2(WW)	18B6	WN-101	A43-100	W11-084	R100L	Hum Balance
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req.	
R6A	100Ω	2(WW)	18B6	WN-101	A43-100	W11-084	R100L	Bias Adj. Bottom Jack
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req.	
R7A	100Ω	2(WW)	18B6	WN-101	A43-100	W11-084	R100L	Bias Adj. Top Jack
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req.	
R8A	250K	½	B-20066P128	AB-51	A47-250K-Z	Q13-130	U44	Radio Level
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

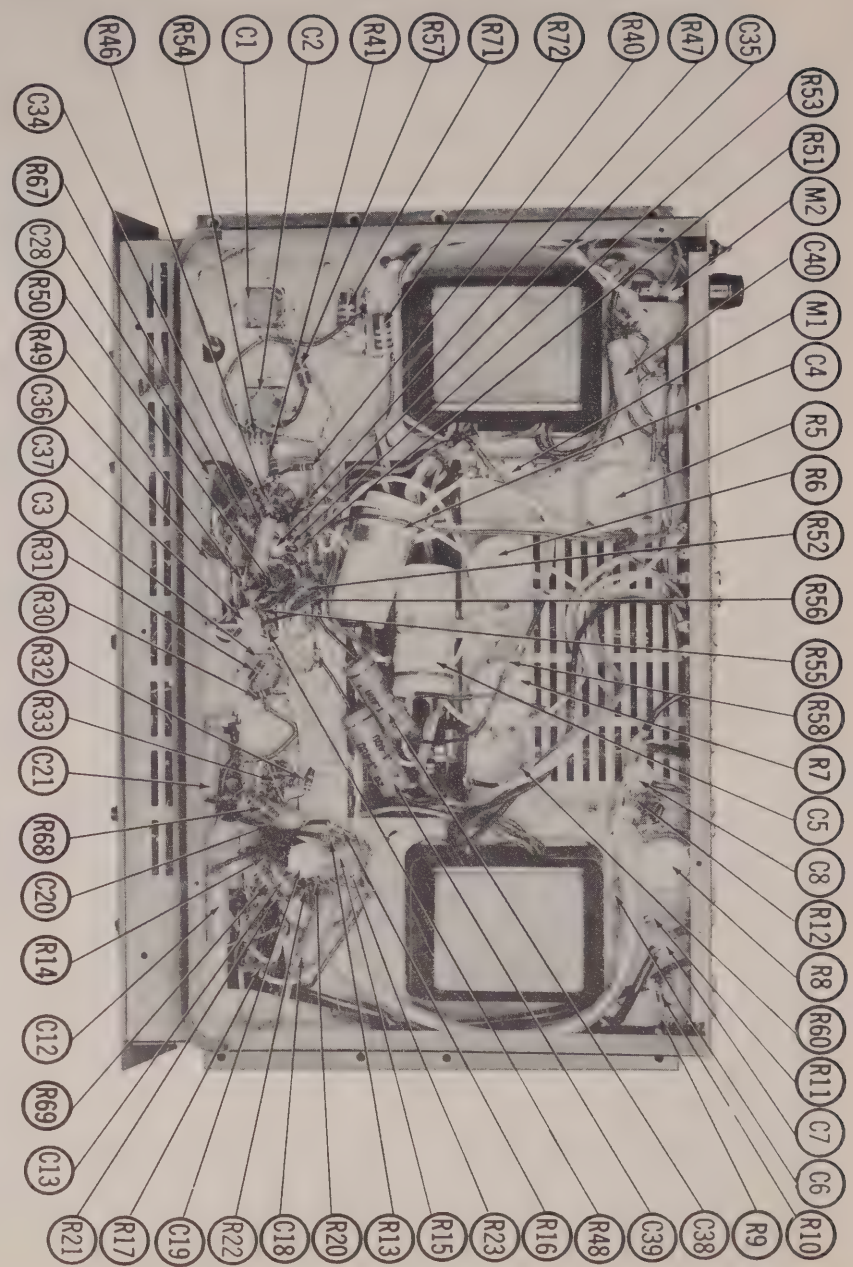
ITEM No.	RATING		Bell Sound PART No.	NOTES
	OHMS	WATT		
R9	33K			
R10	100K			
R11	1meg			
R12	820K			
R13	68K			
R14	10K			
R15	100K 5%			
R16	470Ω			
R17	27K			
R18	100K			
R19	100K			
R20	1meg			
R21	1.5meg			
R22	1000Ω			
R23	100K 5%			
R24	1meg			
R25	390K			
R26	150K			
R27	3.3meg			
R28	10meg			
R29	10meg			
R30	10K			
R31	10K			
R32	4.7meg			
R33	100K			
R34	1000Ω			
R35	1800Ω			
R36	68K			
R37	68K			
R38	68K			
R39	10K			
R40	100K			
R41	1800Ω			

ITEM No.	RATING		Bell Sound PART No.	NOTES
	OHMS	WATT		
R42	27K			
R43	27K			
R44	27K			
R45	100K			
R46	4700Ω 5%			Note 1
R47	270K			
R48	10K			
R49	820K			
R50	2000Ω 5%			
R51	15K 5%			Note 2
R52	270K			
R53	1.2meg			
R54	47K	1		
R55	47K 1%			
R56	47K 1%			
R57	6800Ω	1		
R58	100K 1%			
R59	2200Ω			
R60	100K 1%			
R61	2200Ω			
R62	1000Ω	1		
R63	1000Ω	1		
R64	10Ω 1%			
R65	10Ω 1%			
R66	525Ω 5%	15(WW)	18B3	
R67	820Ω	1		
R68	820Ω	1		
R69	470Ω	1		
R70A	50Ω	7(WW)		
B	50Ω	7(WW)	18B2	
C	50Ω	7(WW)		
R71	47K	2		
R72	47K	2		

Note 1. Some versions may use 2000Ω in this application.

Note 2. Some versions may use 430K in this application.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
				Bell Sound PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
	PRI.	SEC. 1	SEC. 2							
T1	123V tap @ 117V @ 1.6A	820VCT @.150A	100V @.15A	32B5 ①						
	SEC. 3	SEC. 4	SEC. 5							
	5V @2A	6.3V @ 4A								

① Part #32B10 used with 50~ power source.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Bell Sound PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4700Ω tap @ 250Ω from CT	16Ω tap @ 8Ω,4Ω	32B6							

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	Bell Sound PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.15A	42B1 ①		SD-92 ①	M500 ①	① Silicon Type.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Bell Sound PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	3A 125V S/B	B20043P23	B20001P13	313003. 3A 125V S/B	342001	MDX 3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	Bell Sound PART No.	NOTES
M3	Lamp	B20044P2	#51
M4	Lamp	B20044P2	#51
M5	Switch	B20219P4	Input, DPDT, Slide Type
M6	Switch	B20219P4	Lo-Filter, DPDT, Slide Type
M7	Switch	B20219P7	Hi-Filter, SPST, Slide Type
M8	Switch	B20219P6	Speaker, DP3T, Slide Type
M9	Switch	43B2	Selector, Rotary, Wafer, Shorting Type

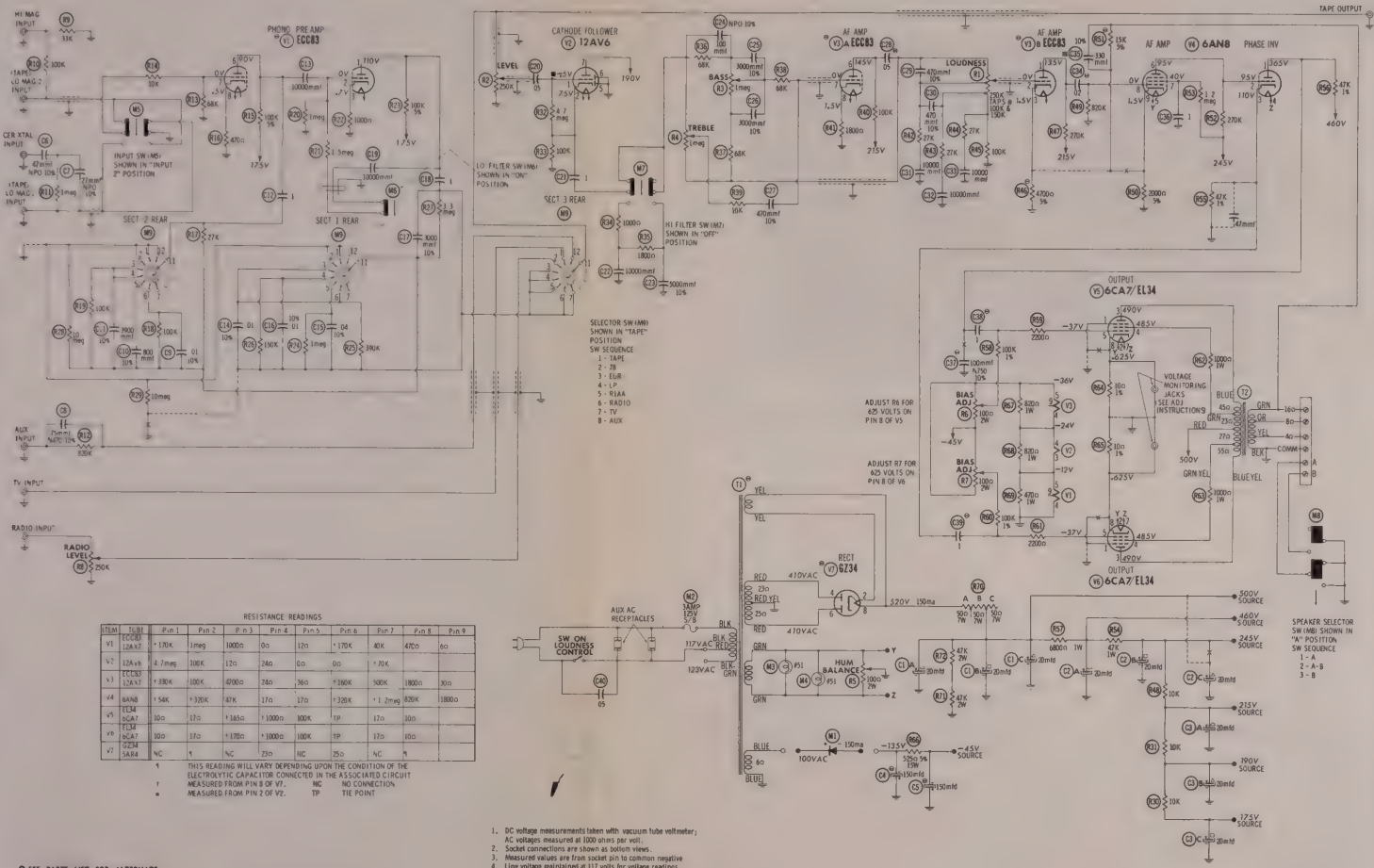
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	26A0380P1	4 Used
Knob	26A0380P2	Loudness
Dial Panel	94C1	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83	*170K	1meg	1000Ω	0Ω	12Ω	*170K	40K	470Ω	0Ω
V2	12AV6	4.7meg	100K	12Ω	24Ω	0Ω	0Ω	*70K		
V3	ECC83	*330K	100K	4700Ω	24Ω	36Ω	*160K	500K	1800Ω	30Ω
V4	6AN8	†54K	*320K	47K	17Ω	17Ω	*320K	*1.2meg	820K	1800Ω
V5	EL34	0Ω	17Ω	*165Ω	*1000Ω	100K	TP	17Ω	0Ω	
V6	6CA7	0Ω	17Ω	*170Ω	*1000Ω	100K	TP	17Ω	0Ω	
V7	6Z34	NC	¶	NC	23Ω	NC	25Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT
† MEASURED FROM PIN 8 OF V7. NC NO CONNECTION
• MEASURED FROM PIN 2 OF V2. TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings
6. All controls at minimum, proper output load connected

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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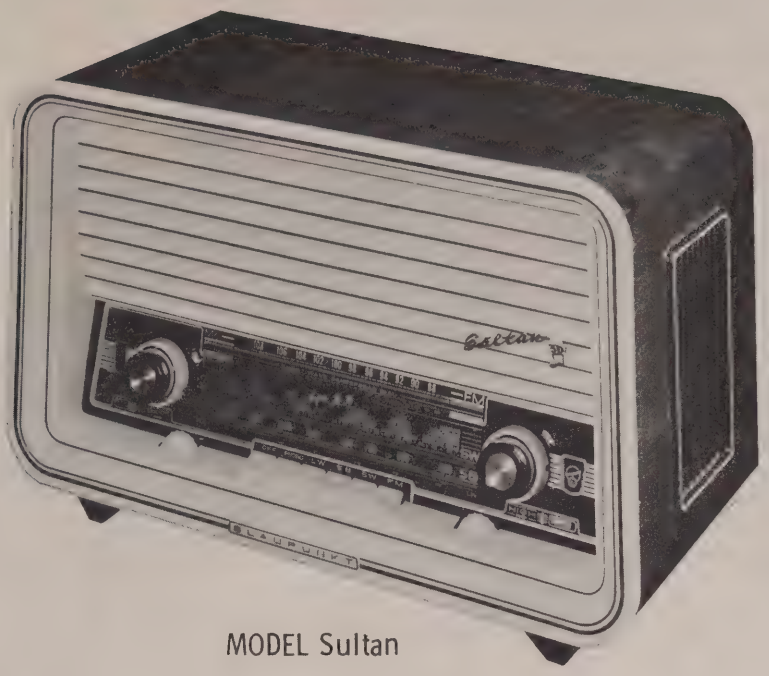
PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

BLAUPUNKT MODELS
Arizona, Sultan 2320, Rio

BLAUPUNKT MODELS
Arizona, Sultan 2320, Rio



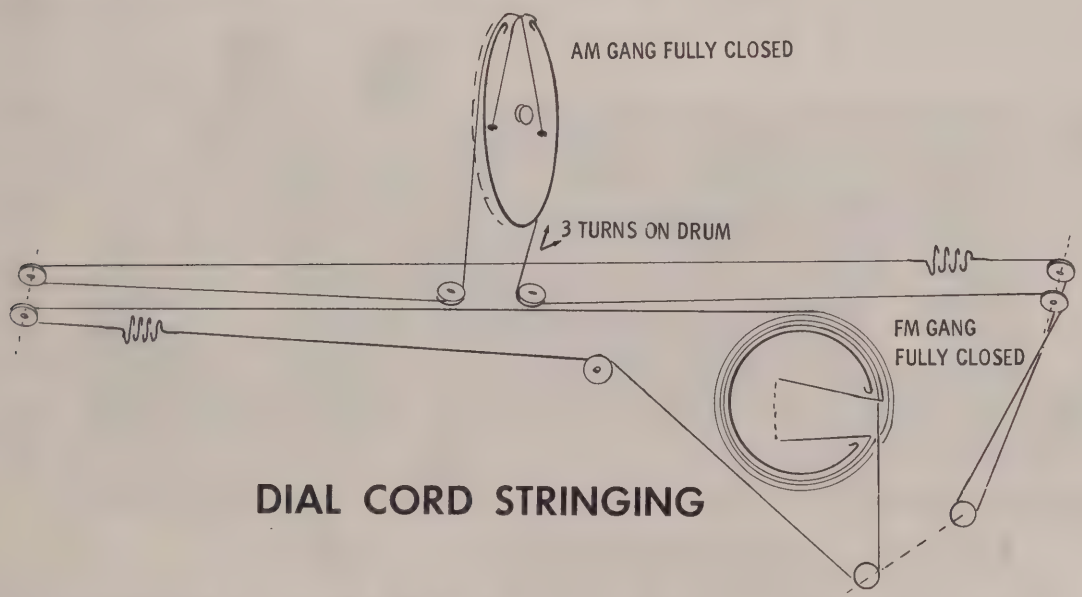
MODEL Sultan

BLAUPUNKT MODELS
Arizona, Sultan 2320, Rio

TRADE NAME	Blaupunkt Models Arizona, Sultan 2320, Rio
IMPORTER	N. Pickens Import Co., 64-01 Woodside Ave., Woodside, N. Y.
TYPE SET	AC Operated FM-BC-SW-LW Receiver
TUBES (Six)	Types ECC85/6AQ8 FM RF Amp.-FM Conv., ECH81/6AJ8 1st FM IF Amp.-AM Mixer-AM Osc., EF89/6DA6 2nd FM-1st AM IF Amp., EABC80/6T8 Ratio Det.-AM Det.-AVC-AF Amp., EM80/6BR5 Tuning Indicator, EL84/6BQ5 Output
POWER SUPPLY	240/220/155/127/110 Volts AC-60 Cycles RATING .62 Amp. @ 117 Volts AC (61 Watts)

TUNING RANGES

FREQ. MOD. 87.4-108MC	BROADCAST 515-1620KC
SHORT WAVE 5.95-18.2MC	LONG WAVE 148-375KC



DIAL CORD STRINGING

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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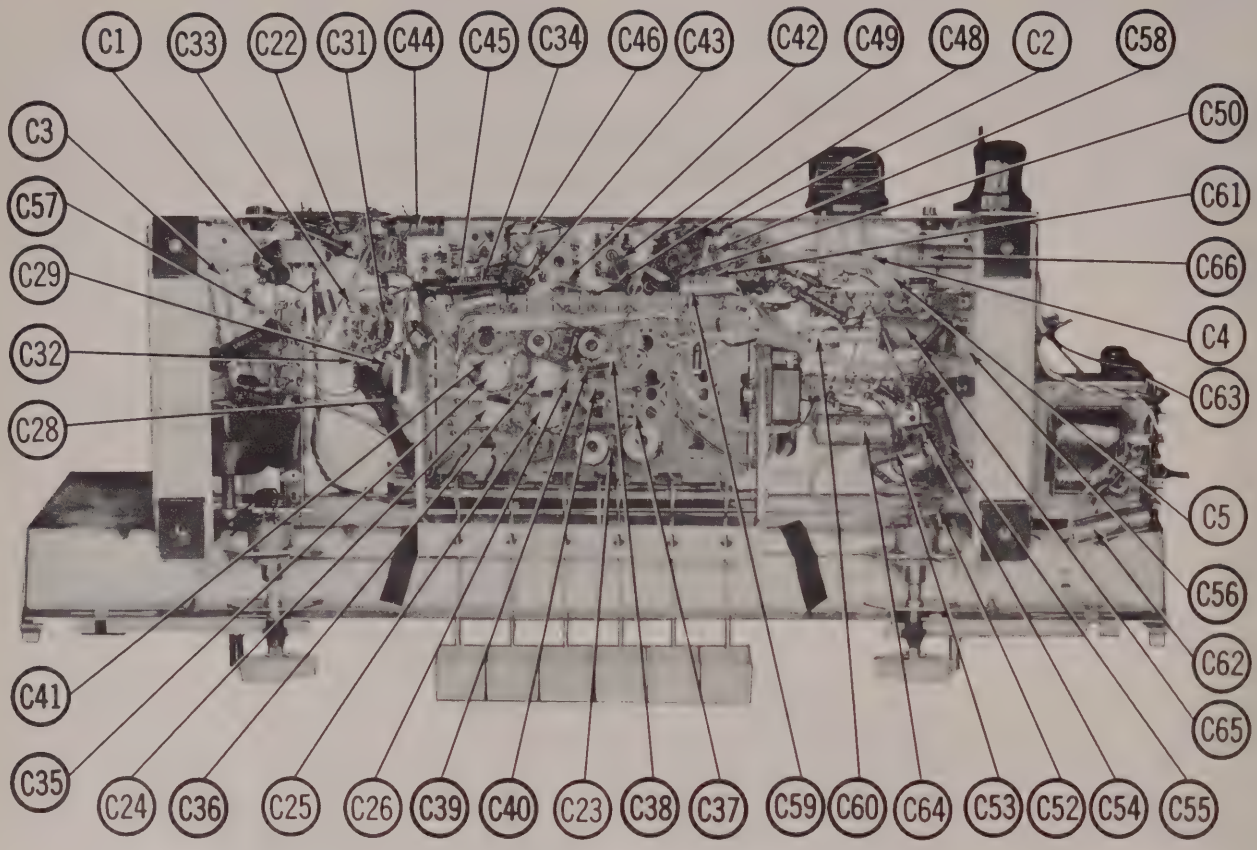
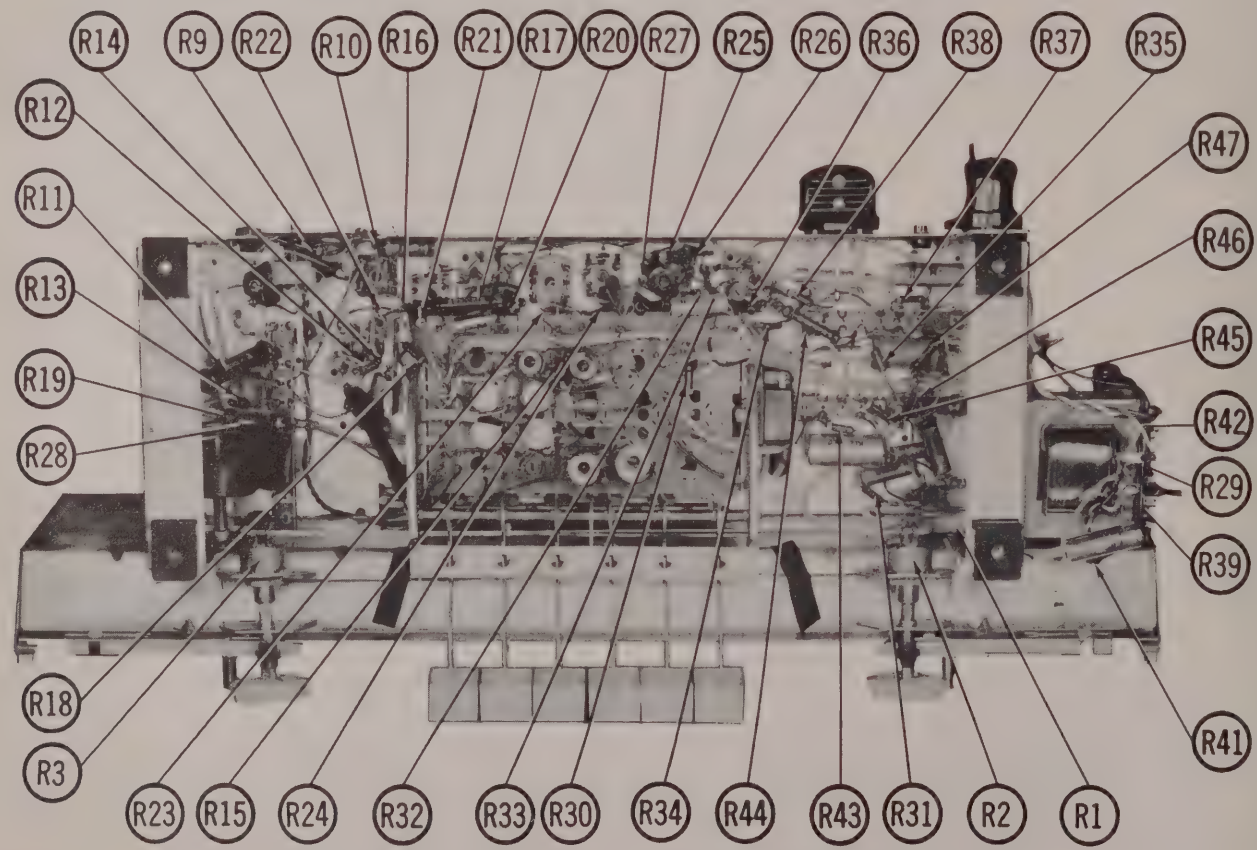
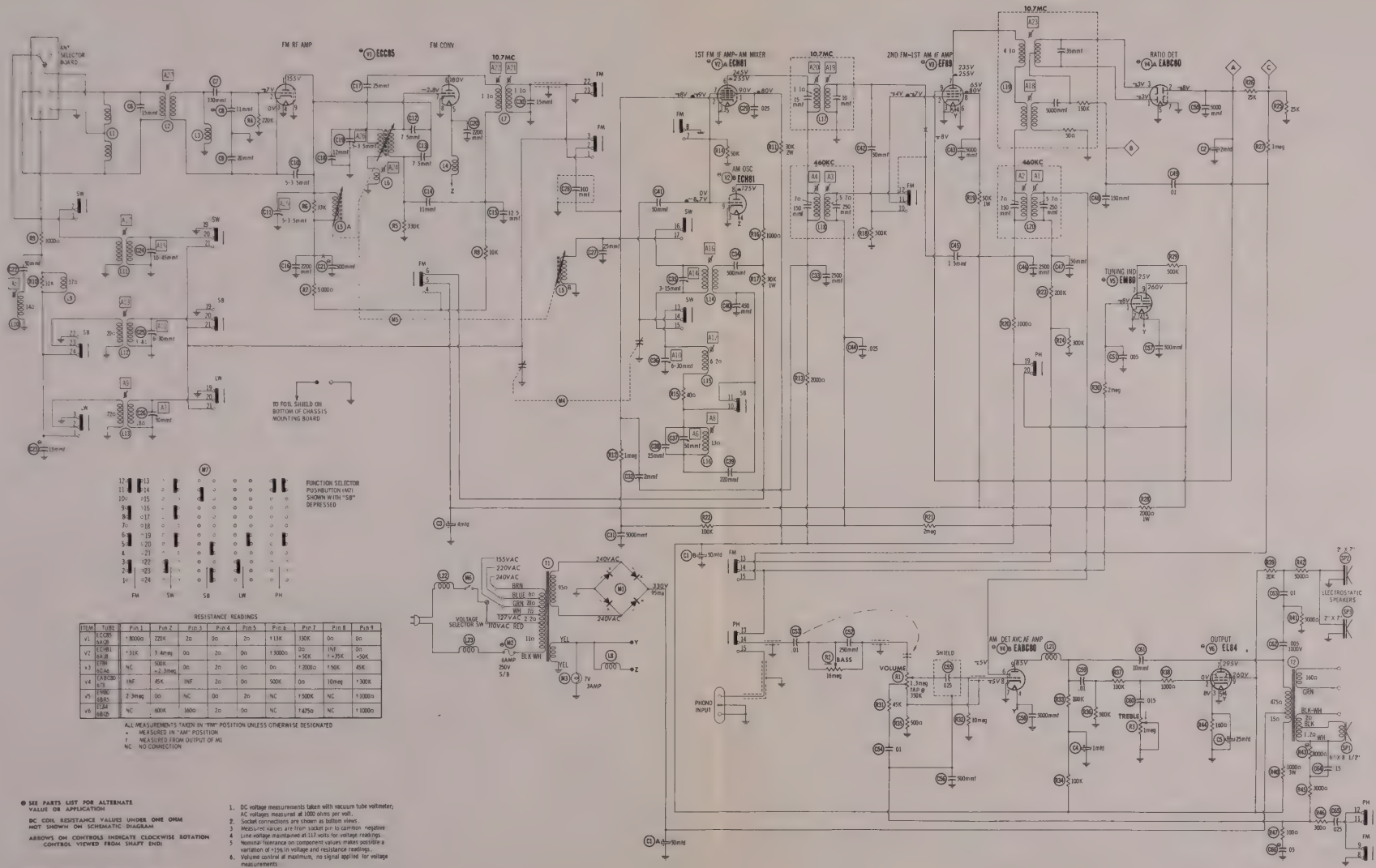
SET 424 FOLDER 4



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC85 6AQ8	*1800Ω	220K	2Ω	0Ω	2Ω	†13K	330K	0Ω	0Ω
V2	ECH81 6A8	*31K	3.4meg	0Ω	2Ω	0Ω	†3000Ω	0Ω +50K	INF †35K	0Ω +50K
V3	EF85 6DA6	NC	500K +2.2meg	0Ω	2Ω	0Ω	0Ω	†2000Ω	†50K	45K
V4	EABC80 6T8	INF	45K	INF	2Ω	0Ω	500K	0Ω	10meg	†300K
V5	EM80 6BR5	2.3meg	0Ω	NC	0Ω	2Ω	NC	†500K	NC	†1000Ω
V6	EL84 6BQ5	NC	600K	160Ω	2Ω	0Ω	NC	†475Ω	NC	†100Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
* MEASURED IN "AM" POSITION
† MEASURED FROM OUTPUT OF M1
NC NO CONNECTION

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. *Nominal-tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting. Turn bass control to minimum, treble control to maximum. Set Bandspread to "0".

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 2 (grid) of ECH81 (V2). Low side to chassis.	460KC (400∿ Mod.)	SB	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	"	"	"	"	"	A5	Adjust for MINIMUM deflection.
3.	"	High side to AM antenna receptacle. Low side to chassis.	350KC	LW	350KC	"	A6, A7	Adjust for maximum deflection.
4.	"	"	160KC	"	160KC	"	A8, A9	"
5.	"	"	1500KC	SB	1500KC	"	A10, A11	"
6.	"	"	546KC	"	546KC	"	A12, A13	"
7.	200mmf	"	18MC	SW	18MC	"	A14, A15	"
8.	"	"	6MC	"	6MC	"	A16, A17	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	200mmf	High side to pin 7 (grid) of ECC85 (V1). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A18, A19, A20, A21, A22	Adjust for maximum deflection.
10.	"	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A23	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
9.	200mmf	High side to pin 7 (grid) of ECC85 (V1). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point Ⓐ. Low side to chassis.	A18, A19, A20, A21, A22	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
10.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A23	Reconnect C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A18 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
11.	270Ω Carbon Resistor	Across FM Antenna terminals.	100MC (Unmod.)	FM	100MC	DC probe to point Ⓐ. Common to chassis.	A24, A25	Disconnect C2. Adjust for maximum deflection.
12.	"	"	91MC	"	91MC	"	A26, A27	Adjust for maximum deflection. Reconnect C2.

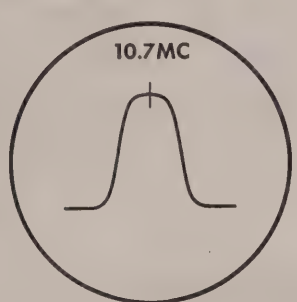


FIG. 1

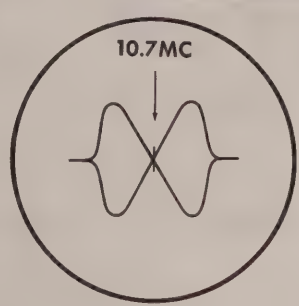
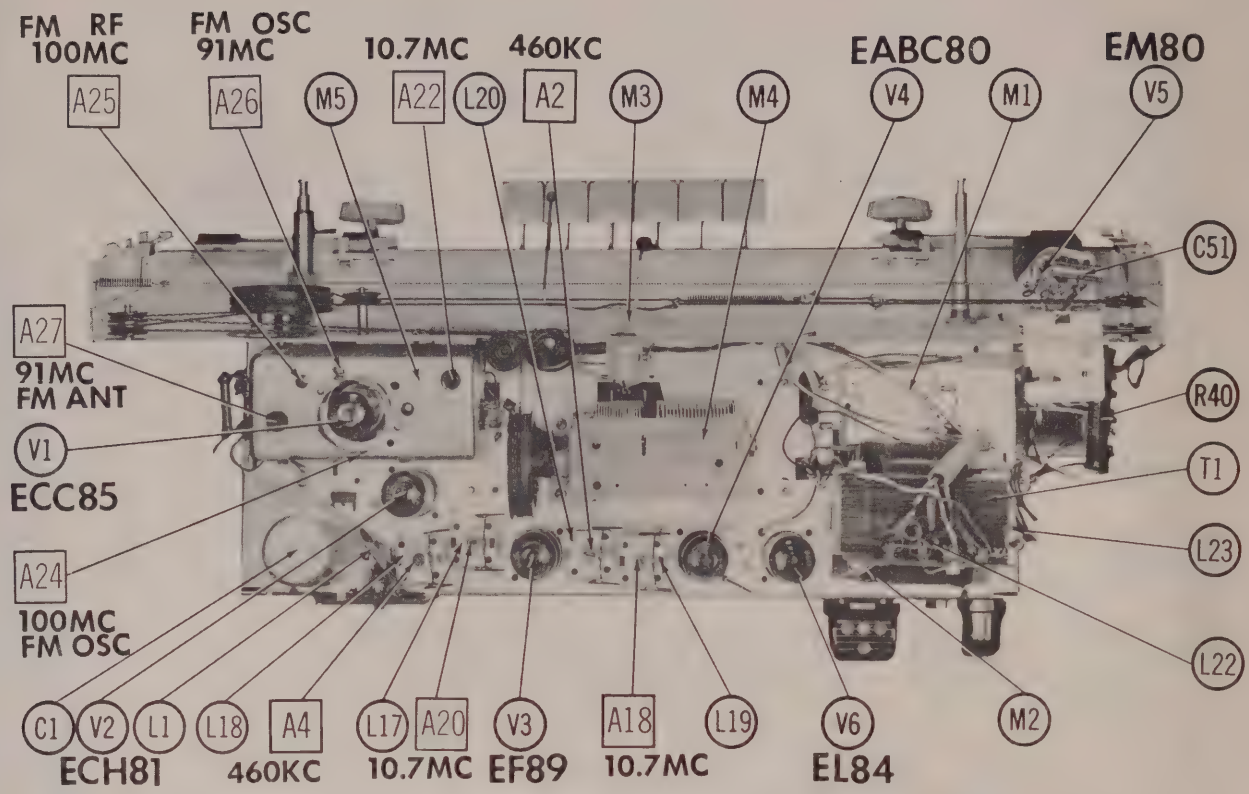
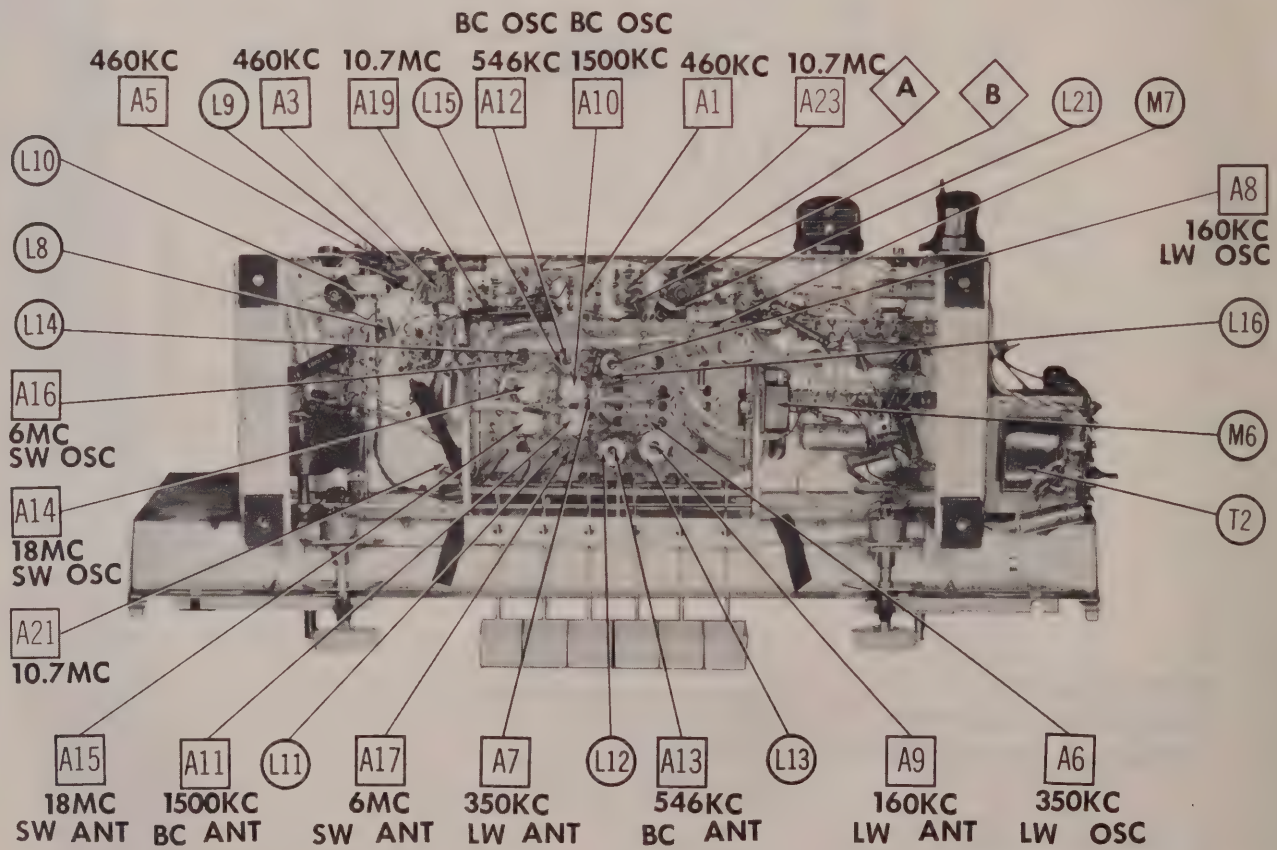


FIG. 2



CHASSIS - TOP VIEW



CHASSIS BOTTON VIEW - ALIGN, INDUCTOR, & MISC IDENT

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	FM RF Amp. - FM Conv.	ECC85/6AQ8 ①
V2	1st FM IF Amp. - AM Mixer-AM Osc.	ECH81/6AJ8 ①
V3	2nd FM-1st AM IF Amp.	EF89/6DA6 ①
V4	Ratio Det. - AM Det. - AVC - AF Amplifier	EABC80/6T8 ①
V5	Tuning Indicator	EM80/6BR5 ①
V6	Output	EL84/6BQ5 ①

① Domestic type listed may not be directly interchangeable in some instances.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA BLAUPUNKT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	385						S-275	R2582 *
B	50	385						MT-4550	
C2	2	35		PRS50V2	BBR2-50	TC302	TD-2-50	MT-0502	TVA-1301 *
C3	4	385		PRS450V4	BR445	TC70	TD-4-450	MT-4504	TVA-1702 *
C4	1	385		PRS450V1	BR145			MMT-4501	R2622 *
C5	25	15		PRS25V25	BBR25-25	TC26	TD-25-25	MT-0225	TVA-1205

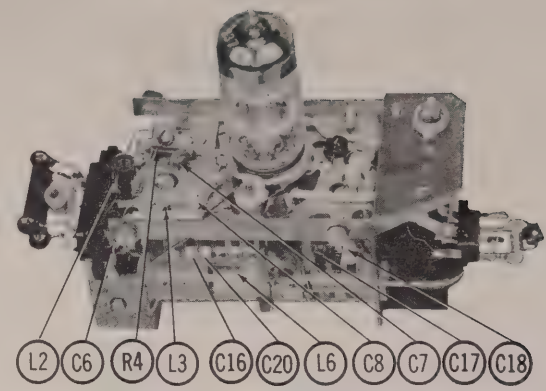
* Not normally in distributors stock. Available thru distributor on order to manufacturer.

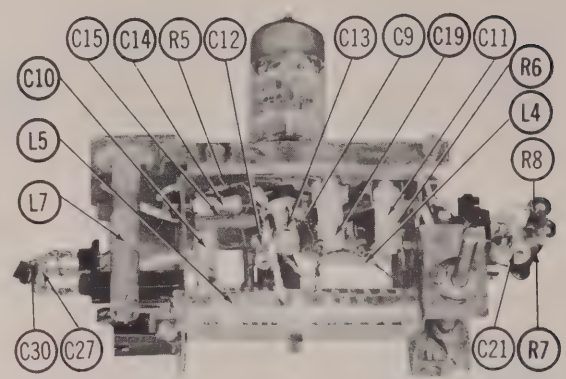
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA BLAUPUNKT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	15			SI 15	D6-150	LT6Q15	UC-5415	5GA-Q15	
C7	330			BPD-00033	DD-331	L10T33	UC-5333	5GA-T33	
C8	11								①
C9	20			SI 20	D6-200	LT6Q2	UC-542	5GA-Q2	
C10	.5-3.5								
C11	.5-3.5								
C12	7.5								
C13	7.5								
C14	11								
C15	12.5								
C16	2200			BPD-0022	DD-222	BYA10D22	UC-5222	5GA-D22	
C17	25			SI 25	D6-250	LT6Q25	UC-5425	5GA-Q25	
C18	12			SI 12	D6-120	LT6Q12	UC-5412	5GA-Q12	
C19	.5-3.5								
C20	2200			BPD-0022	DD-222	BYA10D22	UC-5222	5GA-D22	
C21	500			SI 500	D6-501	LT6T5	UC-535	5GA-T5	②
C22	50			SI 50	D6-500	LT6Q5	UC-545	5GA-Q5	
C23	15			SI 15	D6-150	LT6Q15	UC-5415	5GA-Q15	③
C24	10-45								
C25	6-30								
C26	50								
C27	25			1468-000025	D6-250	5W5Q25	UC-5425	1FM-Q25	
C28	100			SI 100	D6-101	LT6T1	UC-531	5GA-T1	
C29	.025	350		P488N-025		CUB4S22	GEM-4125	4TM-S25	
C30	15			DI-000015	DD-150	L10Q15	UC-5415	5GA-Q15	
C31	5000			SI 5000	D6-502	LT6D5	UC-525	5GA-D5	
C32	2								
C33	2500			SI 2500	D6-252	LT6D25	UC-5225	5GA-D25	
C34	500			1467-0005	D6-501	5W5T5	UC-535	5GA-T5	
C35	3-15								
C36	6-30								
C37	50								
C38	25			1468-000025	D6-250	5W5Q25	UC-5425	1FM-425	
C39	220			1468-00022	D6-221	5W5T22	UC-5322	1FM-322	
C40	450								
C41	50			1468-00005	D6-500	5W5Q5	UC-545	1FM-45	
C42	50			1468-00005	D6-500	5W5Q5	UC-545	1FM-45	
C43	5000			SI 5000	D6-502	LT6D5	UC-525	5GA-D5	
C44	.025	250		P488N-025		CUB4S22	GEM-4125	4TM-S25	
C45	1.5			NPO-SI 1.5	TCZ-1R5	C10V15C	ZT-5515	5TCCB-V15	
C46	2500			SI 2500	D6-252	LT6D25	UC-5225	5GA-D25	
C47	50			1468-00005	D6-500	5W5Q5	UC-545	1FM-45	
C48	150			1468-00015	D6-151	5W5T15	UC-5315	1FM-315	
C49	.01	350		P488N-01	D6-103	CUB4SI	GEM-411	4TM-SI	
C50	5000			SI 5000	D6-502	LT6D5	UC-525	5GA-D5	

FM RF SUB CHASSIS





CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA BLAUPUNKT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C51	.005	500		P688N-005	D6-502	CUB6D5	GEM-625	6TM-D5	
C52	250			1468-00025	D6-251	5W5T25	UC-5325	1FM-325	
C53	.01	350		P488N-01	D6-103	CUB4SI	GEM-411	4TM-SI	
C54	.01	350		P488N-01	D6-103	CUB4SI	GEM-411	4TM-SI	
C55	.025	250		P488N-025		CUB4S22	GEM-4125	4TM-S25	
C56	500			SI 500	D6-501	LT6T5	UC-535	5GA-T5	
C57	500			SI 500	D6-501	LT6T5	UC-535	5GA-T5	
C58	5000			SI 5000	D6-502	LT6D5	UC-525	5GA-D5	
C59	.01	350		P488N-01	D6-103	CUB4SI	GEM-411	4TM-SI	
C60	.015	350		P488N-015	DDI6-153	CUB4SI5	GEM-6115	6TM-SI5	
C61	10			SI 10	D6-100	LT6QI	UC-541	5GA-QI	
C62	.005	1000		P1088N-005		CUB10D5	GEM-1025	10TM-D5	
C63	.01	500		P688N-01	D6-103	CUB6SI	GEM-611	6TM-SI	
C64	.15	250		P488N-15		CUB4P15	GEM-6015	6TM-P15	
C65	.025	350		P488N-025		CUB4S22	GEM-4125	4TM-S25	
C66	.05	350		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	④

① Some versions may use 10mmf in this application.
② Not used in some versions.
③ Some versions may use 15mmf in this application.
④ Some versions may use .025mfd in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BLAUPUNKT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1.3meg	½	W726					Volume, Tap ② 350K
R2	16meg	½	W739					Bass
R3	1meg	½	W732					Treble

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		BLAUPUNKT PART No.	NOTES
	OHMS	WATT		
R4	220K			
R5	330K			
R6	33K			
R7	5000Ω			
R8	10K			
R9	1000Ω			
R10	10K			
R11	30K	2		
R12	1meg			
R13	2000Ω			
R14	50K			
R15	40Ω			
R16	1000Ω			
R17	30K	1		
R18	500K			
R19	50K	1		
R20	1000Ω			
R21	2meg			
R22	100K			
R23	200K			
R24	300K			
R25	25K			

ITEM No.	RATING		BLAUPUNKT PART No.	NOTES
	OHMS	WATT		
R26	25K			
R27	1meg			
R28	2000Ω	1		
R29	500K			
R30	2meg			
R31	45K			
R32	10meg			
R33	200K			
R34	100K			
R35	500Ω			
R36	500K			
R37	100K			
R38	1000Ω			
R39	20K			
R40	1000Ω	3		
R41	5000Ω			
R42	5000Ω			
R43	8000Ω			①
R44	160Ω			
R45	3000Ω			
R46	300Ω			
R47	100Ω			

① Some versions may use 12.5K in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		BLAUPUNKT PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Coil						
L2	FM Ant. Trans.						
L3	RF Choke					VP-9	1.9 Microhenries
L4	Fil. Choke		19-1000	BC-561	4602		.9 Microhenries
L5A	FM RF Coil						
B	SW Osc. Coil						
L6	FM Osc. Coil						
L7	1st FM IF						
L8	Fil. Choke		19-1002	BC-563	4606		2.1 Microhenries
L9	IF Trap Coil						
L10	IF Trap Coil						
L11	SW Ant. Coil						
L12	SB Ant. Coil						
L13	LW Ant. Coil						
L14	SW Osc. Coil						
L15	SB Osc. Coil						
L16	LW Osc. Coil						
L17	2nd FM IF	ZF-720/16Z	16-3487 *	FM-254 *	1463 *		
L18	1st AM IF	ZF-720/14Z					
L19	Ratio Det.	ZF-720/17Z					
L20	2nd AM IF	ZF-720/14Z					
L21	RF Choke						4.4 Microhenries
L22	Line Choke		19-1002	BC-563	4606		2.1 Microhenries
L23	Line Choke		19-1002	BC-563	4606		2.1 Microhenries

* Use original clip and enlarge chassis cut-out.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	BLAUPUNKT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	240V Taps ② 220V, 155V 127V, 117V .62A	240V ② .095A	6.3V ② 2.75A	TF723/40						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.1	BLAUPUNKT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5700Ω Tap ③ 300Ω	4-6Ω	TF27/49							
	Turns Ratio									
	100	SEC.2 : 1								
	3.5	SEC.3 : 1								

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	BLAUPUNKT PART No.	QUAM PART No.	
SP1	6" x 8½"	PM	4-6Ω	LA739/1		
SP2	2" x 7'	Electrostatic		LSH518B		
SP3	2" x 7'	Electrostatic		LSH518B		

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	BLAUPUNKT PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.094A	B250C100		60-9150 ①	D-64 ②	① Two required. ② Silicon type.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			BLAUPUNKT PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	Slo-Blo	0.6A ① 250V						

① .3 Amp. used when receiver is connected to 220-240VAC line.

MISCELLANEOUS

ITEM No.	PART NAME	BLAUPUNKT PART No.	NOTES
M3	Dial Lamp		7V 0.3A
M4	Tuning Cap.		2 Gang, AM (Ant. 13-557mmf, Osc. 15-468mmf)
M5	Tuner		FM
M6	Switch		On-Off, SPST Toggle Type
M7	Switch		Function, Press Button Block

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

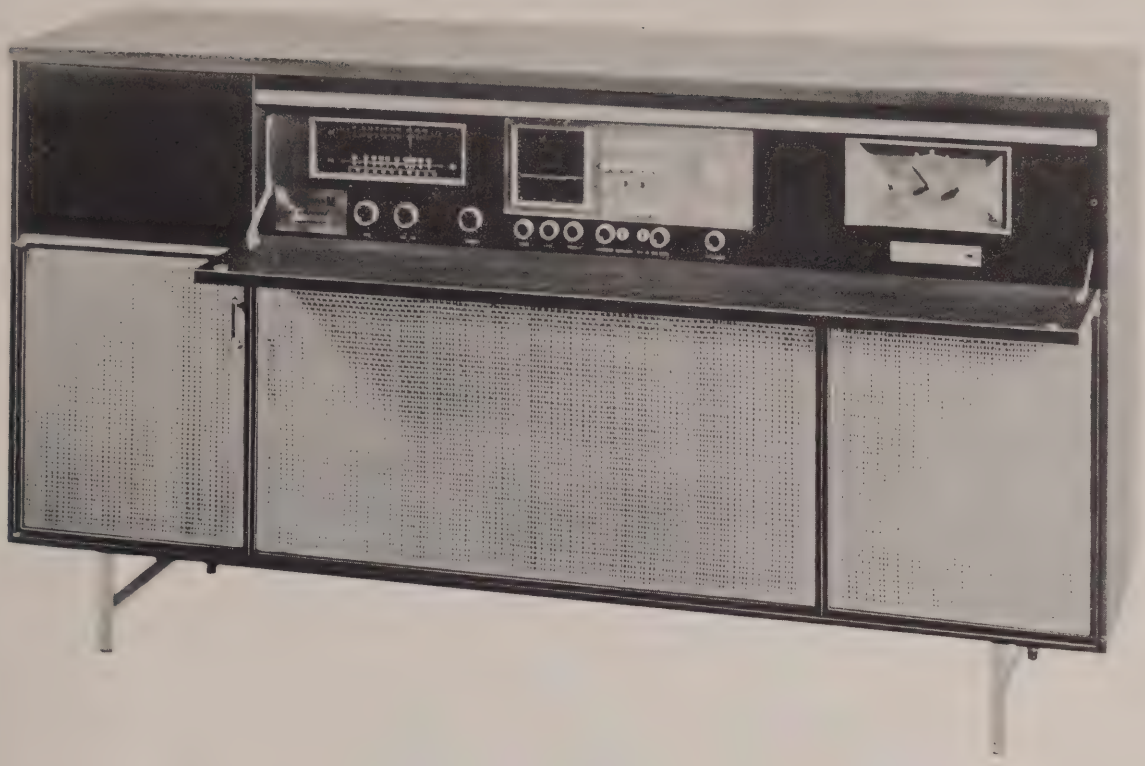
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

COLUMBIA RECORDS "Masterworks Series"

COLUMBIA RECORDS "Masterworks Series"



COLUMBIA RECORDS "Masterworks Series"

TRADE NAME Columbia Records

CHASSIS	MODEL 836	MODEL 844	MODEL 850	MODEL 866	MODEL 872	MODEL 944
515-S-1 FM-AM Tuner			X	X	X	
517-S-1 FM-AM Tuner		X				X
521-S-1 15Watt Amplifier	X	X				X
523-S-1 20Watt Amplifier			X	X	X	
507-S-1 Preamplifier	X	X	X	X	X	X
509-S-1 Oscilloscope Tuning Indicator			X	X	X	
525-S-1 Tape Amplifier				X	X	
519-S-1 Program Clock				X	X	
527-S-1 Tape Transport				X	X	
513-S-1 Record Changer			X (or)	X (or)	X (or)	
529-S-1 Record Changer	X (or)	X (or)	X	X	X	X (or)
511-S-1 Record Changer	X	X				X

MANUFACTURER Columbia Records, 799 Seventh Ave., New York 19, N. Y.

TYPE SET AC Operated FM-AM Tuner and Amplifier With 4 Speed Automatic Record Changer and Tape Recorder

TUBES Tuner : 10
Amplifier : 4
Preamplifier : 6
Scope Tuning Indicator : 3
Tape Amplifier : 5

POWER SUPPLY 110-120 Volts AC-60 Cycles

RATING 1.94 Amp. @ 117 Volts AC (200 Watts) FM

TUNING RANGE - BROADCAST 540 - 1700KC

FREQ. MOD. 88 - 108MC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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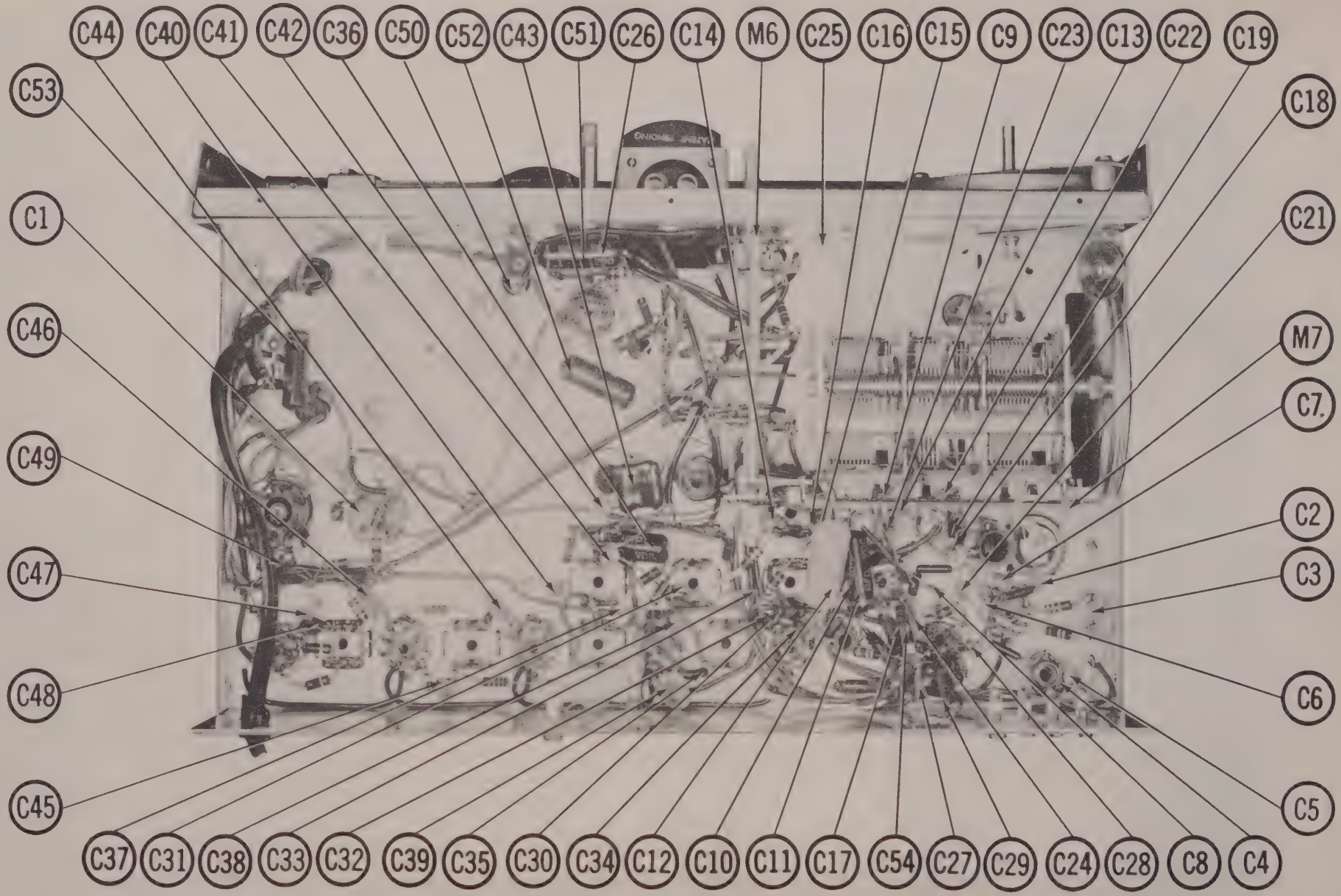
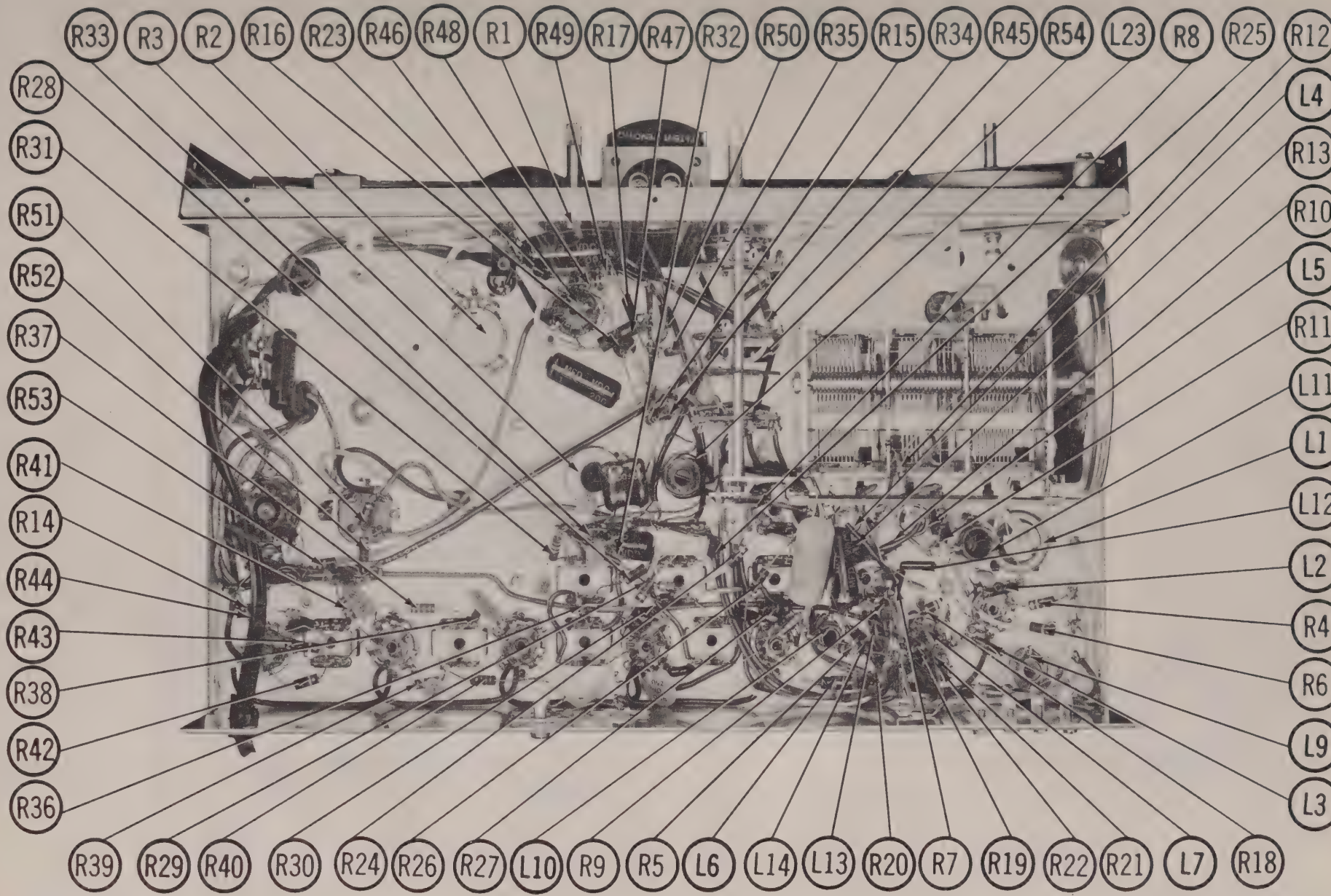
H699

SET 424 FOLDER 5



TUNER CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



TUNER CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Use an insulated alignment screwdriver for adjusting.
With tuning gang fully closed, adjust pointer to coincide with last reference dot on left end of logging scale.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01mfd	High side to pin 2 (grid) of 6U8 (V2). Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open	DC probe to point Ⓐ. Common to chassis	A1, A2, A3, A4, A5, A6	Adjust for maximum deflection.
2.	"	High side to AM ant. term. Low side to chassis.	455KC	"	"	"	A7	Adjust for MINIMUM deflection.
3.	"	High side to point A. Low side to chassis.	10KC	"	"	AC probe to audio output Jack. Low side to chassis.	A8, R3	"
4.	"	High side to AM ant. term. Low side to chassis.	1500KC	"	1500KC	DC probe to point Ⓐ. Common to chassis.	A9, A10, A11	Adjust for maximum deflection.
5.	"	"	600KC	"	600KC	"	A12	Adjust for maximum deflection. Repeat steps 4 and 5.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	200mmf	High side to pin 1 (grid) of 6AU6 (V7). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point Ⓑ. Common to chassis.	A13	Adjust for maximum deflection.
7.	"	"	"	"	"	"	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
8.	"	High side to pin 2 (grid) of 6U8 (V2). Low side to chassis.	"	"	"	DC probe to point Ⓒ. Common to chassis.	A15, A16	Adjust for maximum deflection.
9.	"	"	"	"	"	DC probe to point Ⓐ. Common to chassis.	A17, A18, A19, A20 A21, A22	"

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	200mmf	High side to pin 1 (grid) of 6AU6 (V7). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point Ⓑ. Low side to chassis.	A13	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
7.	"	"	"	"	"	"	A14	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines.
8.	"	High side to pin 2 (grid) of 6U8 (V2). Low side to chassis.	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A15, A16	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
9.	"	"	"	"	"	Vert. Amp. to point Ⓐ. Low side to chassis.	A17, A18, A19, A20 A21, A22	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
10.	270Ω Carbon Resistor	High side to FM antenna terminal. Low side to chassis.	90MC (Unmod.)	FM (AFC Off)	90MC	DC probe to point Ⓐ. Common to chassis.	A23, A24	Adjust for maximum deflection.
11.	"	"	106MC	"	106MC	"	A25, A26, A27, A28	"

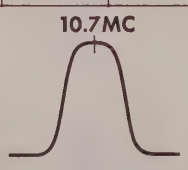


FIG. 1

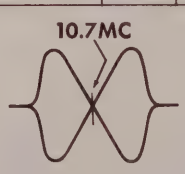
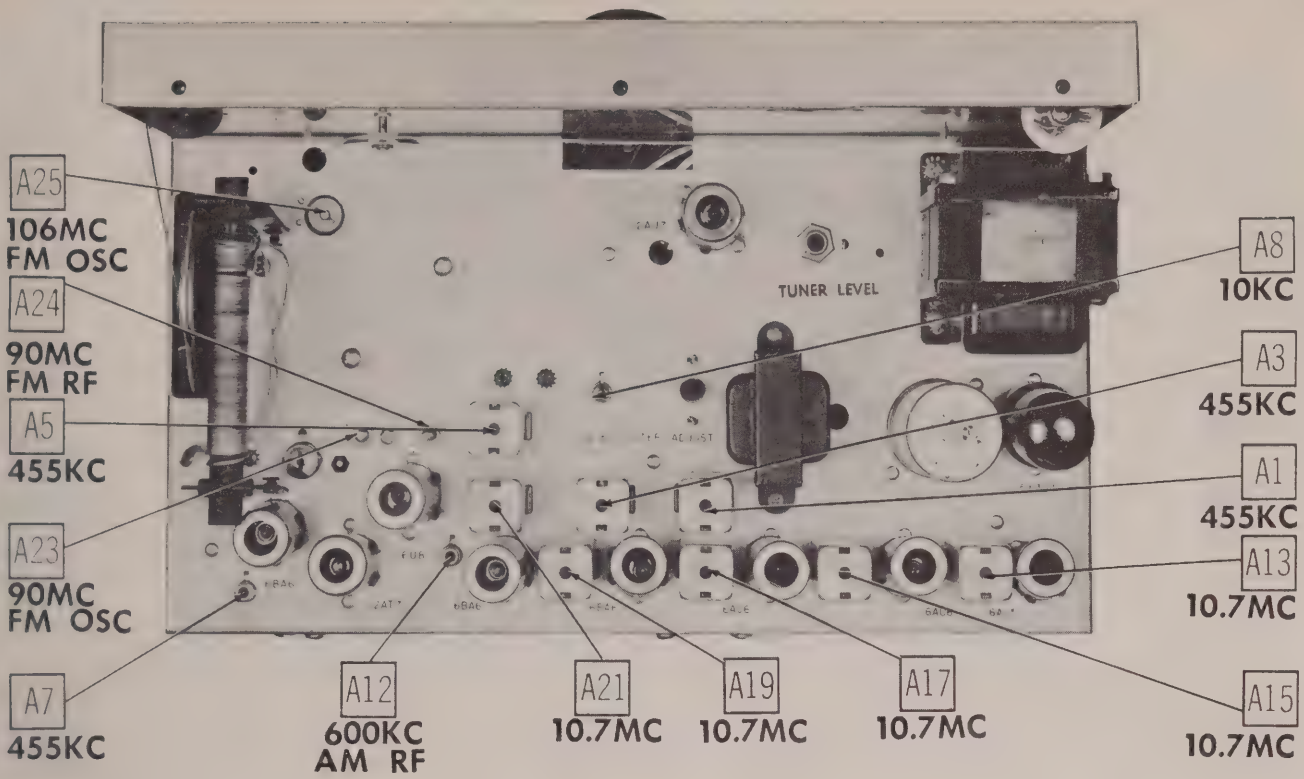
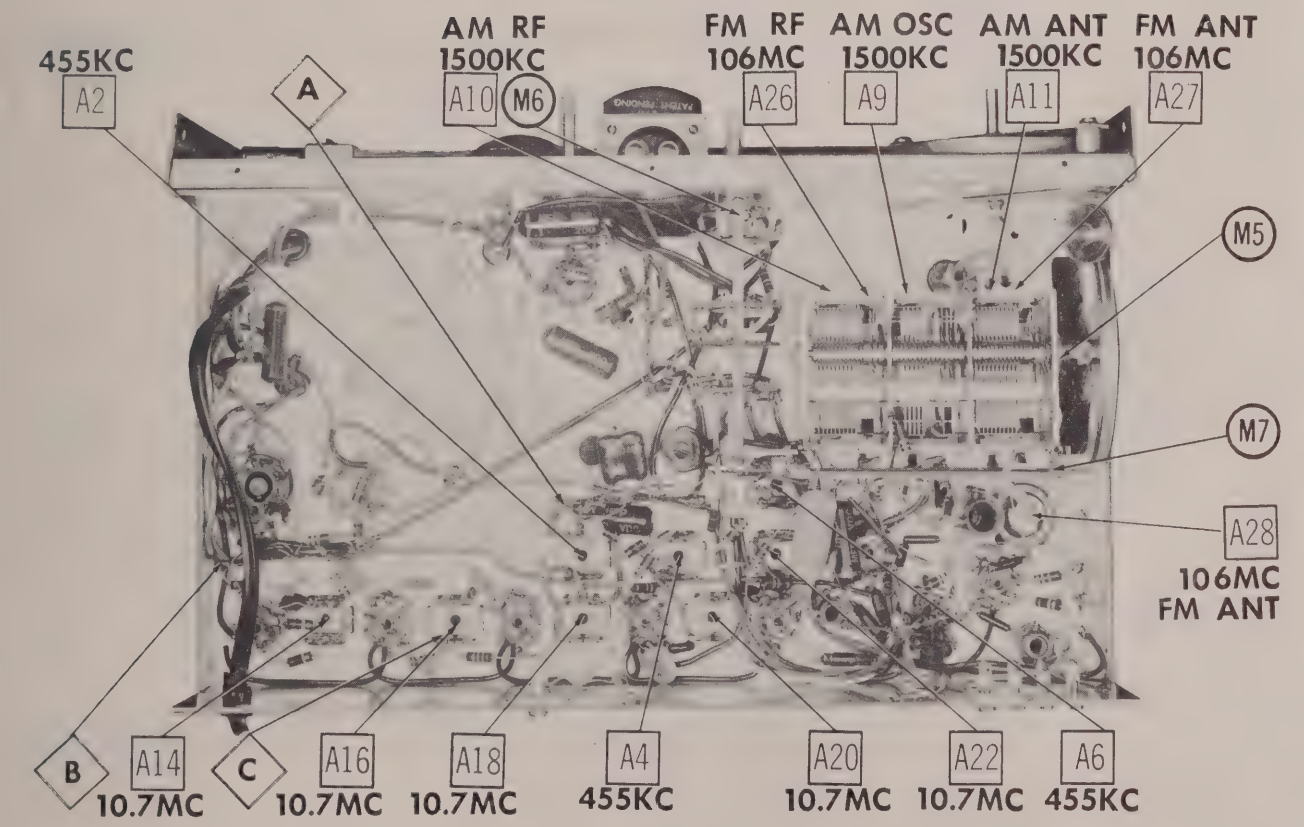


FIG. 2



TUNER CHASSIS TOP VIEW - ALIGNMENT IDENT



TUNER CHASSIS BOTTOM VIEW - ALIGN. & MISC IDENT

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM AM RF Amplifier	6BA6	
V2	FM AM Mixer-FM AM Osc.	6U8	
V3	FM AFC	12AT7	
V4	1st FM-AM IF Amplifier	6BA6	
V5	2nd FM-AM IF Amplifier	6BA6	

ITEM No.	USE	TYPE	NOTES
V6	1st FM Limiter-AM Det. - AVC	6AU6	
V7	2nd FM Limiter	6AU6	
V8	Discriminator	6AL5	
V9	AF Amp.-Cath. Follower	12AU7	
V10	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

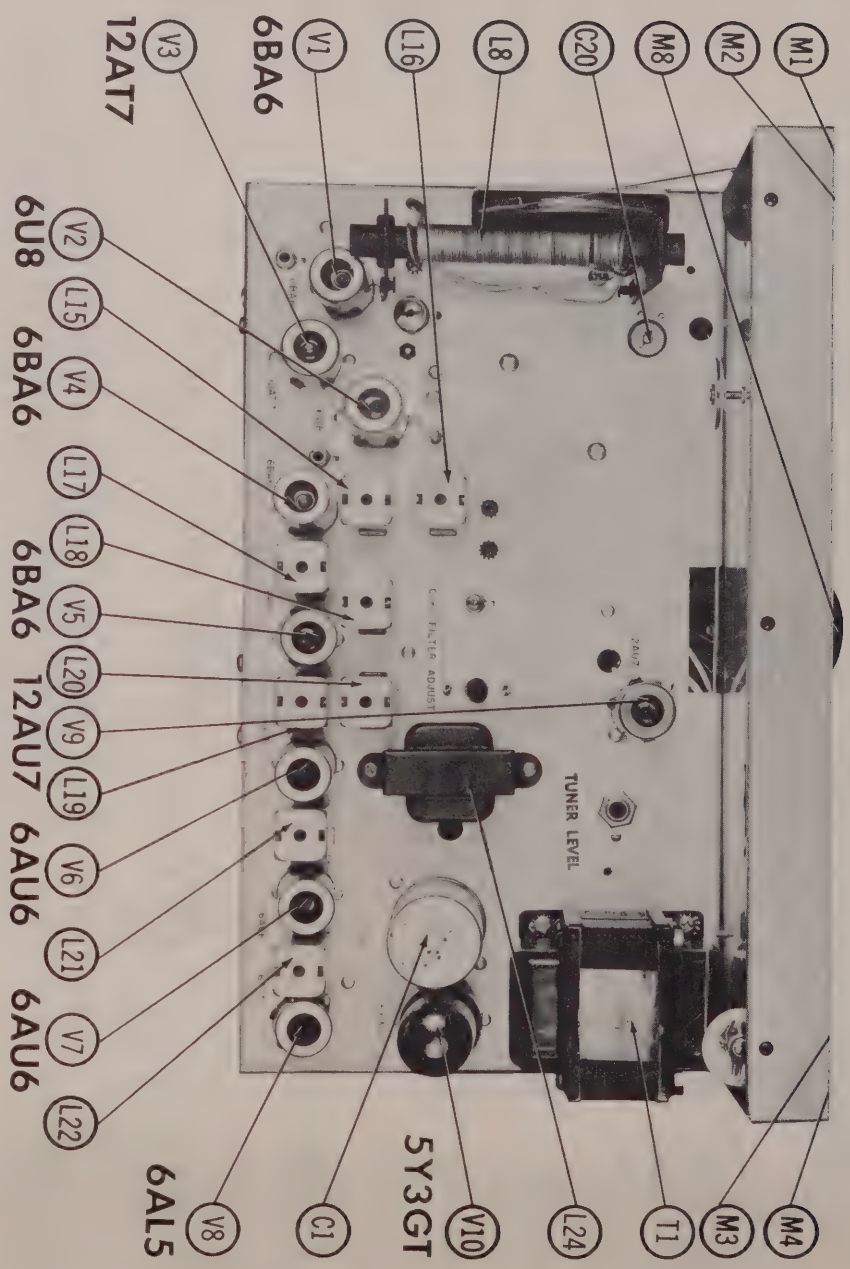
ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Columbia Records PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	300	98-107	AFH3-25-50	D0034	FP375. 5	TMQ-120	Q-012	TVL-3583
B	■80	250							
C	▲40	250							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES	
	CAP.	VOLT	Columbia Records PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.		
C2	50		98-73			C10Q5U			N750	10%
C3	10000		98-88							10%
C4	50		98-90	NPO-DI 50	DTZ-50	C10Q5C	ZT-545	5TCC-Q5	NPO	10%
C5	10		98-98						N1500	10% ①
C6	10000		98-88							10%
C7	82		98-89						N1500	10%
C8	20		98-91	NPO-DI 20	DTZ-20	C10Q2C	ZT-542	5TCC-Q2	NPO	10%
C9	50		98-92			C10Q5U			N750	10%
C10	20		98-93	NPO-DI 20	DTZ-20	C10Q2C	ZT-542	5TCC-Q2	NPO	10%
C11	. 047	400	98-8							10%
C12	. 1	400	98-94							10%
C13	5		98-96		DTN-5	C10V5U	NT-555	5TCUB-V5	N750	10%
C14	3. 3		98-102	NPO-SI 3. 3	TCZ-3R3	CTA6V33C	ZT-5533	5TCCB-V33		10%
C15	510		98-103	1469-00051		5R5T5I		MS-351		5%
C16	10000		98-88							10%
C17	10000		98-88							10%
C18	30		98-95			C10Q3U			N750	10%
C19	100		98-97	NPO-SI 100	DTZ-100	C10T1C	ZT-531	5TCC-T1	NPO	10%
C20	3-12								NPO	
C21	10		98-98						N1500	10%
C22	50		98-73			C10Q5U			N750	10%
C23	800		98-100							10%
C24	10000		98-88							10%
C25	1000									10% ① ①
C26	. 1	200	98-105	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1		
C27	10000		98-88							10%
C28	500		98-99		MD-501					10%
C29	800		98-100							10%
C30	510		98-103	1469-00051		5R5T5I		MS-351		5%
C31	3. 3		98-102	NPO-SI 3. 3	TCZ-3R3	CTA6V33C	ZT-5533	5TCCB-V33		10%
C32	510		98-103	1469-00051		5R5T5I		MS-351		5%
C33	10000		98-88							10%
C34	10000		98-88							10%
C35	510		98-103	1469-00051		5R5T5I		MS-351		5%
C36	. 047	400	98-8							10%
C37	10000		98-88							10%
C38	10000		98-88							10%
C39	10000		98-88							10%
C40	50		98-73			C10Q5I			N750	10%
C41	100		98-79	NPO-DI 100	DD-101	L10T1	ZT-531	5TCC-T1		10%
C42	500		98-99						N1500	10%
C43	2200		98-104	1464-0022		1R5D22		MS-222		5%
C44	10000		98-88							10%
C45	100		98-79						N1500	10%

TUNER CHASSIS—TOP VIEW



TUNER PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Columbia Records PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C46	10000		98-88						10%
C47	4.7			NPO-SI 4.7	TCZ-4R7	CTA6T1C	ZT-5547	5TCCB-V47	10% ①
C48	100		98-79						N1500 10%
C49	1500		98-106						10%
C50	.1	200	98-105	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C51	.01	400	98-22	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C52	.1	200	98-105	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C53	.01	600	98-101	P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	N1500 10%
C54	100		98-79						

① Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Columbia Records PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5meg	½	99-155	B-87	A47-5meg-S	Q11-141	U67	AFC
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	1meg	½	99-167 ①	AB-69	A47-1meg-S	Q11-137	U54	Tuner Level, Tap @ 500K
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	
R3A	10K	½	99-166	AB-14	A47-10K-S	B11-116	TA14L	10KC Filter Adjust
B	Shaft			AK-1	FKS-1/4	SK2	Not Req.	

① Tap not used.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Columbia Records PART No.	NOTES
R4	270K		99-114	
R5	470Ω		99-137	
R6	12K		99-160	
R7	1meg		99-10	
R8	1000Ω		99-44	
R9	12K		99-160	
R10	68Ω		99-157	Note 1
R11	6800Ω		99-161	
R12	22K		99-2	
R13	10K	1	99-150	
R14	1meg		99-10	
R15	430K 5%		99-156	
R16	2.2meg 5%		99-153	
R17	2.2meg 5%		99-153	
R18	4300Ω 5%		99-154	
R19	68Ω		99-157	
R20	470K		99-17	
R21	270Ω		99-158	
R22	27K	1	99-170	
R23	3000Ω 5%		99-159	
R24	270K		99-114	
R25	1000Ω		99-44	
R26	12K		99-160	
R27	68Ω		99-157	
R28	1000Ω		99-44	
R29	12K		99-160	

ITEM No.	RATING OHMS	RATING WATT	Columbia Records PART No.	NOTES
R30	68Ω		99-157	
R31	39K		99-165	
R32	1meg		99-10	
R33	82K		99-11	
R34	27K		99-170	
R35	1500Ω		99-39	
R36	68K		99-68	Note 2
R37	68K		99-68	
R38	22K		99-2	
R39	39K		99-165	Note 3
R40	68K		99-68	Note 2
R41	39K		99-165	Note 4
R42	100K 5%		99-141	
R43	100K 5%		99-141	
R44	39K		99-165	
R45	82K		99-11	
R46	39K		99-165	
R47	1500Ω	1	99-168	
R48	470K		99-17	
R49	470Ω		99-137	
R50	10K		99-14	
R51	5600Ω		99-169	
R52	100K		99-8	
R53	27K		99-90	
R54	2.7Ω	1		Note 5

Note 1. Not used in some versions.
Note 2. Some versions may use 10K in this application (Part #99-14).
Note 3. Some versions may use 33K in this application (Part #99-22).
Note 4. Some versions may use 68K in this application (Part #99-68).
Note 5. Some versions may use 3Ω 1W in this application (Part #99-164).

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Columbia Records PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Trans.	515-7					
L2	Cathode Choke	515-11		SW-631	4609		5 Microhenries
L3	RF Choke	515-11		SW-631	4609		5 Microhenries
L4	FM RF Coil	515-23					
L5	FM Osc. Coil	515-15					
L6	Fil. Choke	515-13	19-1001	BC-562	4604		1.5 Microhenries
L7	RF Choke	515-11		SW-631	4609		5 Microhenries
L8	Loop Stick	515-9					
L9	IF Trap	515-19					
L10	AM RF Coil	515-21					
L11	AM Osc. Coil	515-17			70-OSC *		
L12	Cathode Choke	515-11		SW-631	4609		5 Microhenries
L13	Fil. Choke	515-13	19-1001	BC-562	4604		1.5 Microhenries
L14	Fil. Choke	515-13	19-1001	BC-562	4604		1.5 Microhenries
L15	1st FM IF	515-25					
L16	1st AM IF	515-29					
L17	2nd FM IF	515-25					
L18	2nd AM IF	515-29					
L19	3rd FM IF	515-25					
L20	3rd AM IF	515-31	16-6758	BC-353	12-C2	RF-2	
L21	Limiter	515-25	16-3487	FM-254	1463		
L22	Discriminator	515-27	17-3494	FM-253	1464		
L23	10KC Filter	515-33					

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES.	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA Columbia Records PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L24	.075A	120Ω	3.3 Hy.	515-35	C5024 ①		F-806	C-2327	26C82	C-9X ①

① Drill new mounting hole.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Columbia Records PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .52A	340VCT @ .075A	5V @ 1.6A	515-37						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 2.6A	6.3VCT @ .3A								

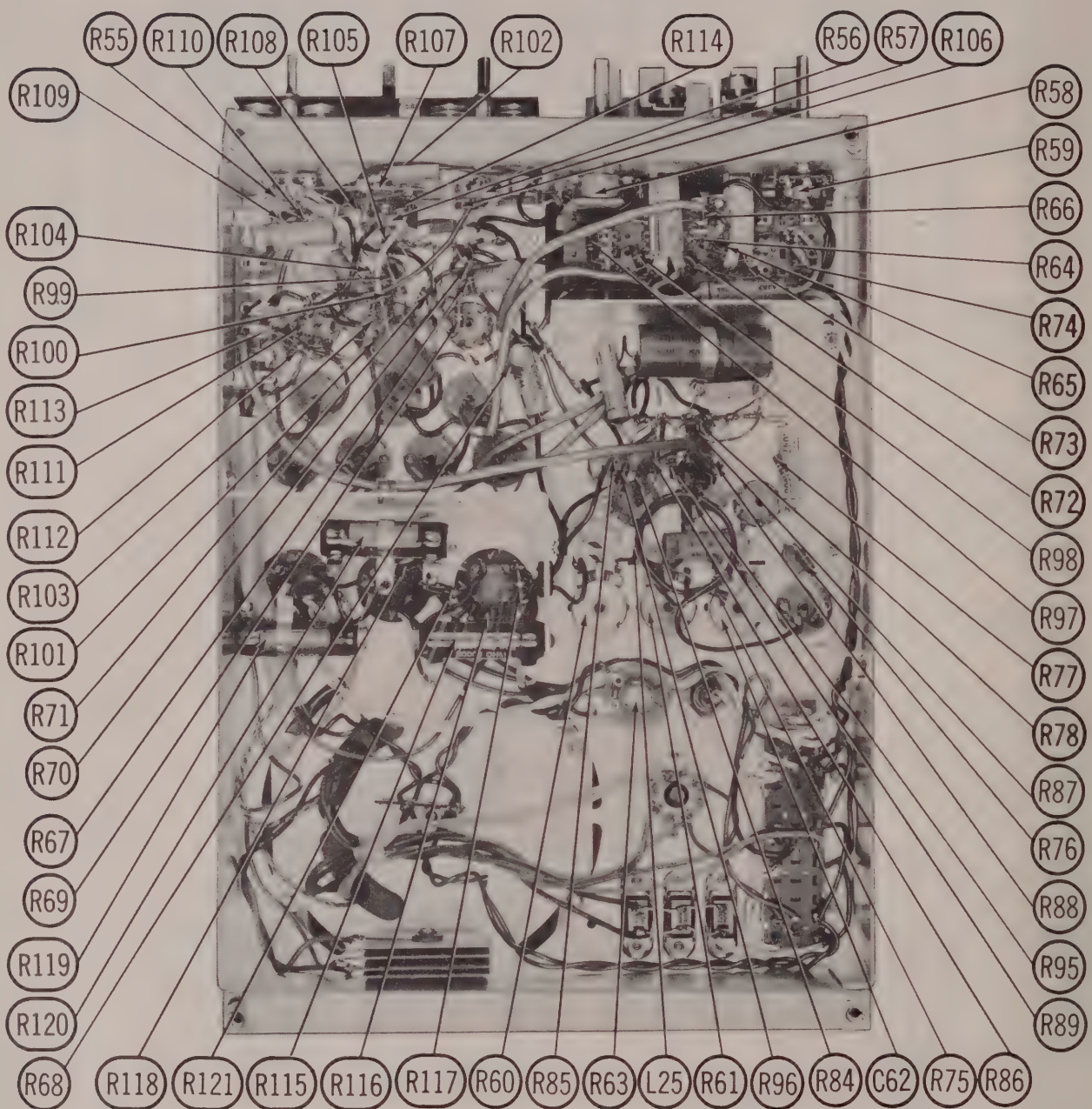
MISCELLANEOUS

ITEM No.	PART NAME	Columbia Records PART No.	NOTES
M1	Lamp	87-62	#1847
M2	Lamp	87-62	#1847
M3	Lamp	87-62	#1847
M4	Lamp	87-62	#1847
M5	Tuning Cap.	98-87	6 Gang (AM Sections: Ant. 28-505mmf, RF 33-505mmf)
M6	Switch	86-45	Selector, Rotary, Wafer Type
M7	Switch	86-44	Selector, Slide Type
M8	Meter	517-7	Tuning (Chassis 517-S-1 only)

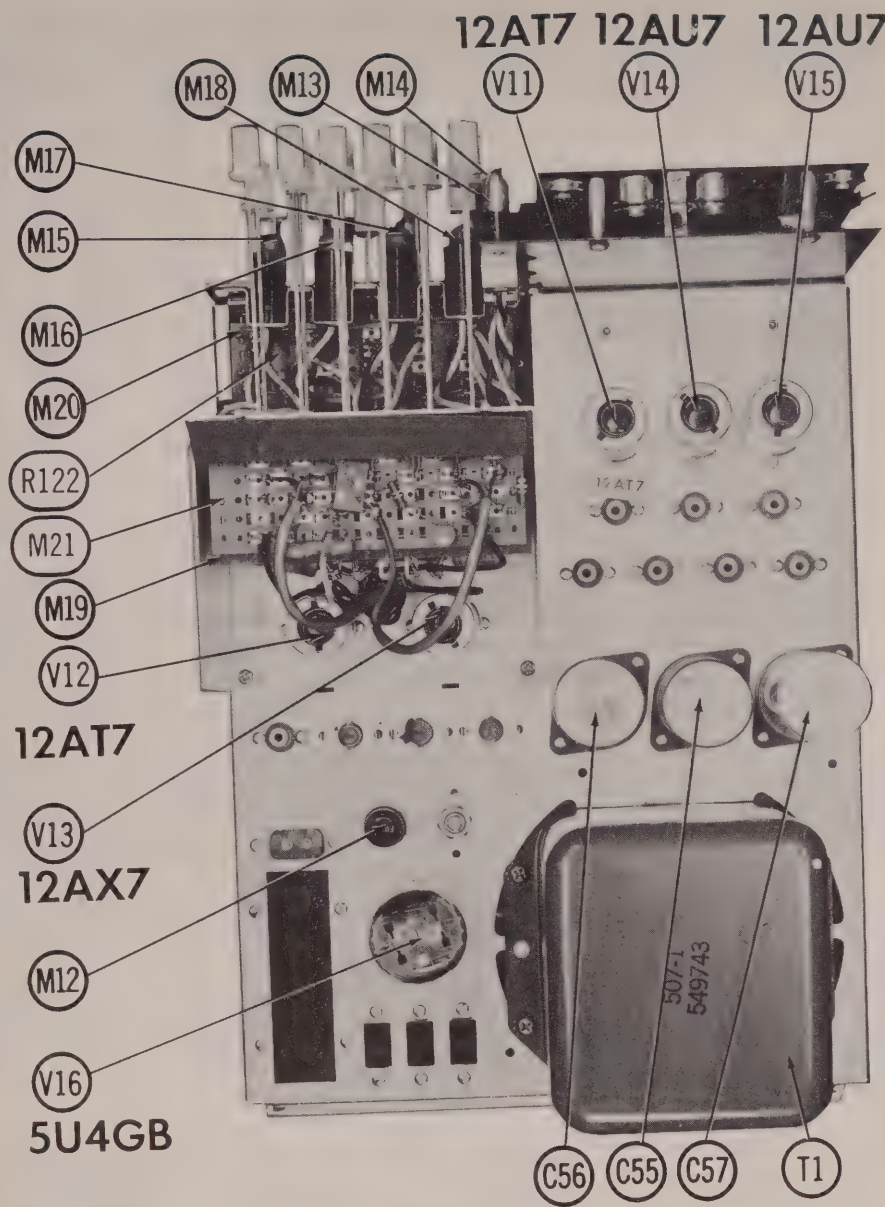
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

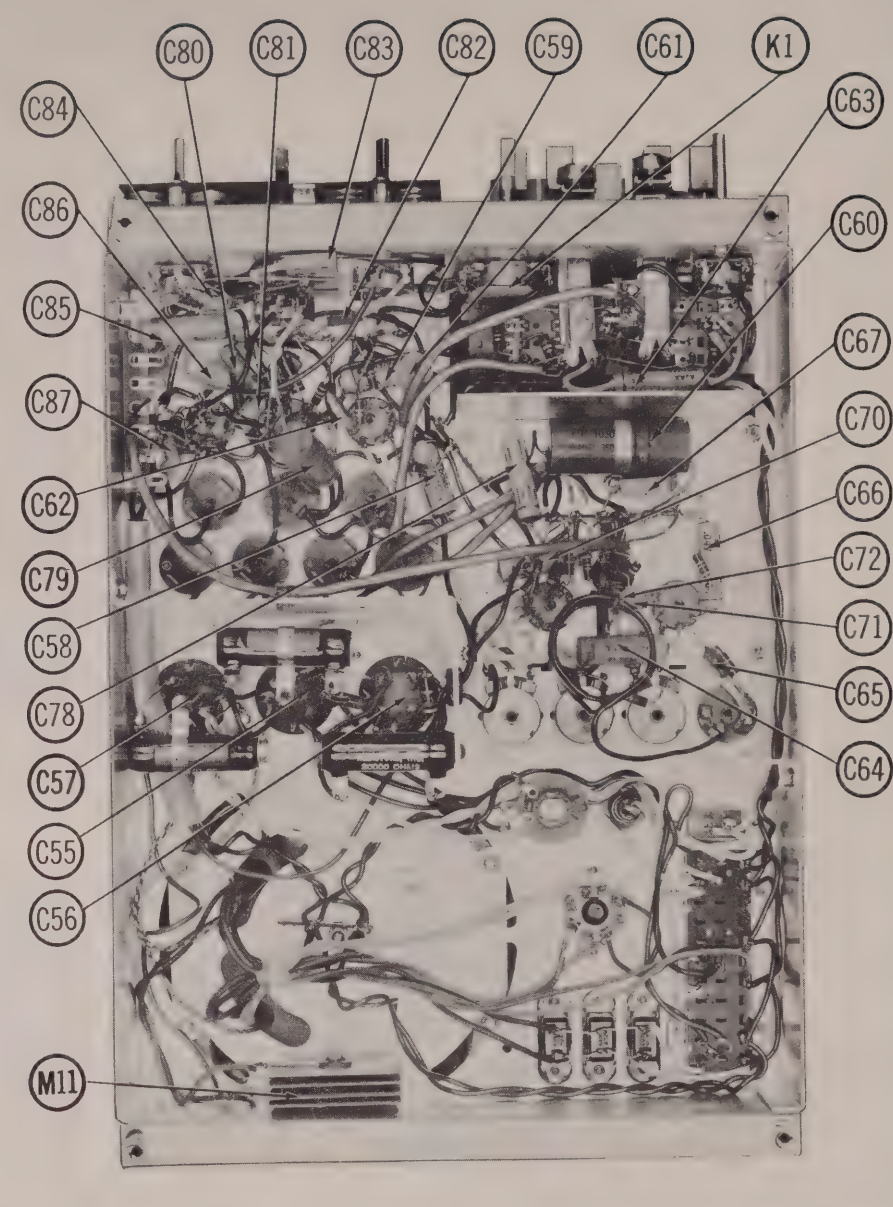
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



PREAMP CHASSIS BOTTOM VIEW - RESISTOR IDENT



PREAMP CHASSIS - TOP VIEW



PREAMP CHASSIS BOTTOM VIEW - CAP & MISC IDENT

PRE-AMP PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V11	Mic Preamplifier	12AT7	
V12	Phono Preamplifier	12AT7	
V13	Phono Amplifier	12AX7	

ITEM No.	USE	TYPE	NOTES
V14	AF Amplifier	12AU7	
V15	AF Amp.-Cath. Follower	12AU7	
V16	Rectifier	5U4GB	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Columbia Records PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C55A	▲40	500	98-39	AFH2-72	B0530	FP288	TMD-62	D-275	TVL-2940
B	▲40	500							
C56A	▲20	450	98-10	AFH4-14	D0130	FP444	TMQ-12	Q-040	TVL-4763
B	■20	450							
C	▲20	450							
D	20	450							
C57A	▲1000	25	98-58		A0130				R2695 *
B	▲2000	15			BR20001				
C58	25	6	98-18	SRE6V25	BBR25-6	TC26	TD-25-25	MMT-625	TVA-1205
C59	25	6	98-18	SRE6V25	BBR25-6	TC28	TD-25-25	MMT-625	TVA-1205
C60	20	350	98-26	PRS350V20	BR2035	TC65	TD-20-350	MT-4520	TVA-1608

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Columbia Records PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C61	20000		98-7	BPD-02	DD-203	BYB6S2		5HK-S2	
C62	20000		98-7	BPD-02	DD-203	BYB6S2		5HK-S2	
C63	.047	400	98-63	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C64	.1	200	98-77	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C65	5			1468-000005	D6-050	5W5V5		1FM-55	①
C66	.047	400	98-63	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C67	3000		98-82	1467-003	D6-302	1W5D3	MC461	1FM-23	
C68	500		98-99		D6-501	5R5T5		MS-35	
C69	800		98-100			1R5T8		MS-38	
C70	.047	400	98-63	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C71	750		98-108			1R5T75		MS-375	
C72	700		98-109			1R5T7		MA-37	
C73	.1	150	98-28	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C74	.022	200	98-67	P288N-022	DD-203	CUB4S22	GEM-4122	2TM-S22	
C75	.005	200	98-68	P288N-005	D6-502	CUB6D5	GEM-625	6TM-D5	
C76	.033	200	98-69	P288N-033	DF-303	CUB6S33	GEM-4133	2TM-S33	
C77	.022	200	98-67	P288N-022	DD-203	CUB4S22	GEM-4122	2TM-S22	
C78	.047	400	98-63	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C79	.2	400	98-75	P488N-2		CUB4P22	GEM-4022	4TM-P22	
C80	.0047	400	98-68	P488N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C81	.047	400	98-63	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C82	50		98-73	1468-00005	D6-500	5W5Q5		1FM-45	
C83	1000		98-70	1467-001	D6-102	1W5D1	MC255	1FM-21	
C84	.0012	200	98-72						
C85	.047	200	98-71	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C86	20000		98-7	BPD-02	DD-203	BYB6S2		5HK-S2	
C87	.1	150	98-28	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C88	.005	200	98-68	P288N-005	D6-502	CUB6D5	GEM-625	6TM-D5	
C89	250			1468-00025	D6-251	5W5T25		1FM-325	②

① Some versions may use 8mmf in this application (Part #98-74).
② Some versions may use 650mmf in this application (Part #98-66).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Columbia Records PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R55A	5meg	½	507-23	AB-87	A47-5meg-S	Q11-141	U67	Bass
B	Shaft			AK-9	FKS-1/4	PQ	Not Req.	
R56A	100K	½	507-21	BB-102		Q13-128		Audio Out, Level
B	100K	½				M13-128		Monitor, Level
R57A	5meg	½	507-27	AB-88	A47-5meg-Z	Q13-141	U65	Treble
B	Shaft			AK-9	RS-3	PQ	Not Req.	
R58A	1meg	½	507-17	BT-165		Q18-137XX	UDT-289	Loudness, Tap ⓐ 200K & 500K
B	Shaft			Not Req.		Not Req.	Not Req.	
R59A	1meg	½	507-25	B-70	A47-1meg-Z	Q13-137	U53	Microphone Level
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R60A	1meg	½	99-105	AB-69	A47-1meg-S	Q11-137	SU-54	Level
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R61A	1meg	½	99-105	AB-69	A47-1meg-S	Q11-137	SU-54	Balance
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R62A	100K	½	99-101	AB-40	A47-100K-S	Q11-128	SU-41	Load
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R63A	100Ω	2(WW)	99-181 ①	WN-101	A43-100	W11-084	R100L	Hum Balance
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req.	

① Part #99-38 may be used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Columbia Records PART No.	NOTES
R64	4.7meg		99-3	
R65	22K		99-2	
R66	220K		99-1	
R67	150K		99-16	
R68	470Ω		99-137	
R69	150K		99-16	
R70	1500Ω		99-39	
R71	270K		99-114	
R72	270K		99-114	
R73	270K		99-114	
R74	270K		99-114	
R75	22K		99-2	
R76	2.7meg		99-172	
R77	47K		99-20	
R78	10K		99-14	
R79	270K		99-114	
R80	100K		99-8	
R81	100K		99-8	
R82	47K		99-20	
R83	15K		99-136	
R84	1meg		99-10	
R85	47K		99-20	
R86	2200Ω		99-56	
R87	47K		99-20	
R88	270K		99-114	
R89	33K		99-22	
R90	4700Ω		99-41	
R91	4700Ω		99-140	
R92	150K		99-16	
R93	82K		99-11	

ITEM No.	RATING OHMS	RATING WATT	Columbia Records PART No.	NOTES
R94	150K		99-16	
R95	47K		99-20	
R96	2200Ω		99-56	
R97	27K		99-90	
R98	270K		99-114	
R99	47K	1	99-20	
R100	1800Ω		99-120	
R101	82K		99-11	
R102	10K		99-14	Note 1
R103	82K		99-11	
R104	2200Ω		99-56	
R105	82K		99-11	
R106	220K		99-1	
R107	100K 5%		99-141	
R108	220K		99-1	
R109	220K		99-1	
R110	4700Ω 5%		99-140	
R111	100K		99-8	
R112	2700Ω		99-9	
R113	4700Ω		99-41	
R114	10K		99-14	Note 1
R115	20K	10(WW)	99-143	
R116	6800Ω	1	99-139	
R117	4700Ω	1	99-33	
R118	1500Ω	5(WW)	99-142	
R119	30Ω	20(WW)	99-131	Note 2
R120	7500Ω	20(WW)	99-176	Note 3
R121	100Ω	1		
R122	2.7Ω	1		

Note 1. Some versions may use 5600Ω in this application (Part #99-169).
Note 2. Some versions may use 15Ω in this application.
Note 3. Some versions may use 20K in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Columbia Records PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L25	Hum Choke	①					2.1 Microhenries

① Not used in some versions.

PRE-AMP PARTS LIST AND DESCRIPTIONS (Continued)

AUDIO CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	Columbia Records PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L26		460Ω CT	6.5 Hy.	94-15						

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Columbia Records PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	117V @ 1.6A	720VCT @ .150A	5V @ 2.7A	507-1						
	SEC. 3	SEC. 4	SEC. 5							
	36VCT @ .8A	6.3V @ 5.2A	6.3V @ .6A							

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Columbia Records PART No.	REPLACEMENT DATA
K1	Tone Compensation	Part of Loudness Control R58		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	Columbia Records PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M9	VRII					

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	Columbia Records PART No.	JENSEN PART No.	WALCO PART No.	
M10	GE-4-S (78) GE-4-MGD (LP)	† W-69S or ♦ W-69D † W-69MGS or ♦ W-69MGD	† G-3 or ♦ G-3D † G-1 or ♦ G-1D	† Jewel ♦ Diamond

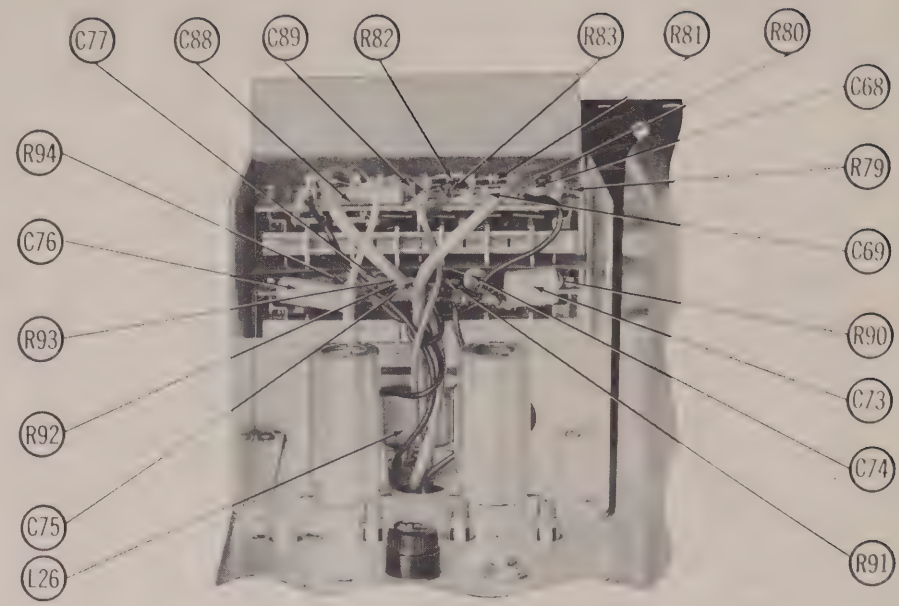
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	Columbia Records PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M11	.72A	507-33	339C1EX1	M1B	5N26-2C1-RV	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Columbia Records PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M12	3AG	5A 250V	94-16	507-45	312005. (3AG 5A 250V)	342001	MTH5	HKP

PUSHBUTTON ASSEMBLY

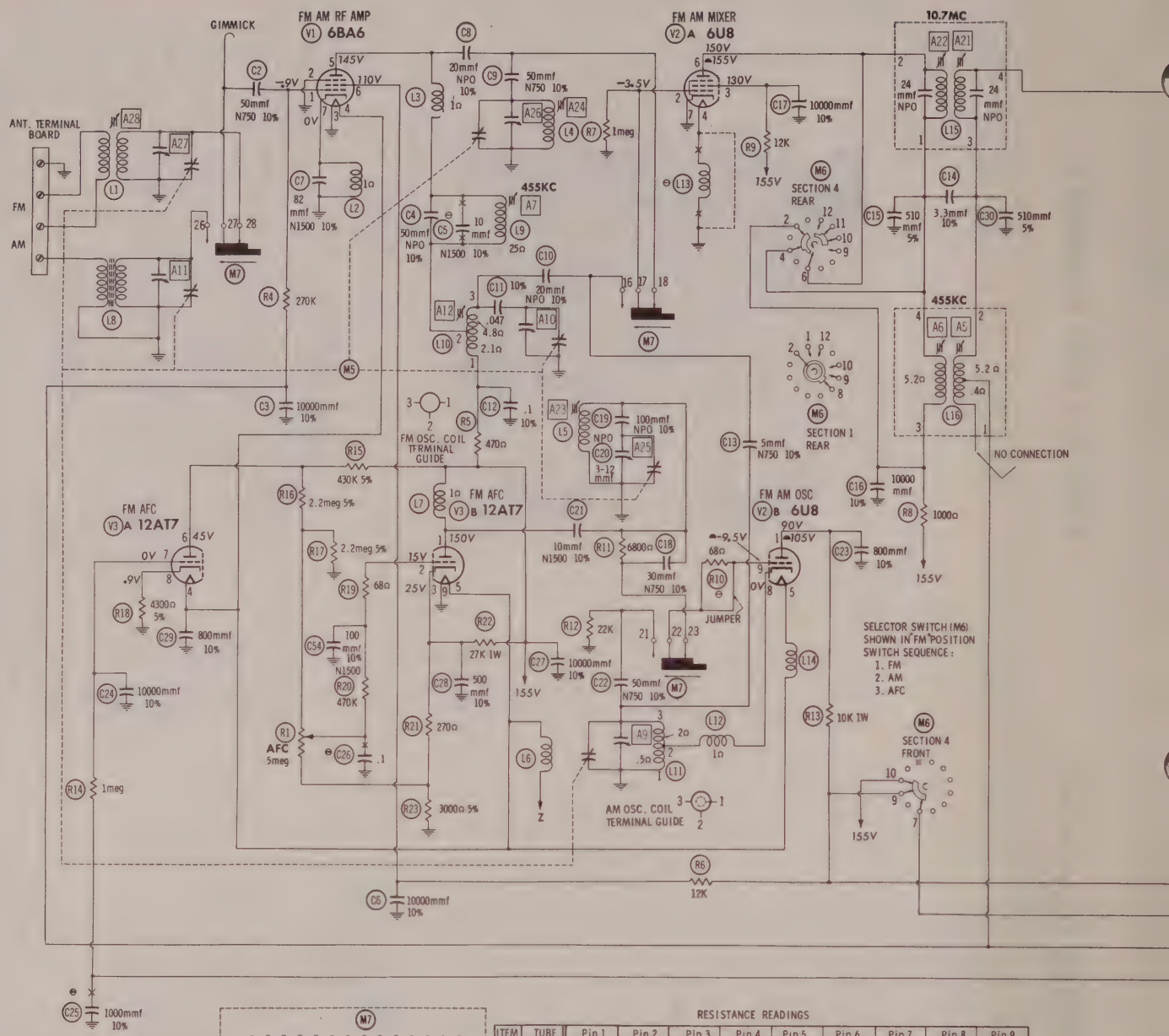


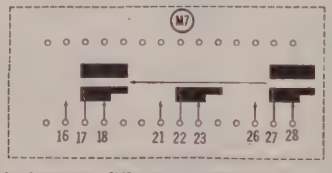
MISCELLANEOUS

ITEM No.	PART NAME	Columbia Records PART No.	NOTES
M13	Lamp	93-26	#47, Frosted
M14	Lamp	93-26	#47, Frosted
M15	Lamp	93-27	#51, Frosted
M16	Lamp	93-27	#51, Frosted
M17	Lamp	93-27	#51, Frosted
M18	Lamp	93-27	#51, Frosted
M19	Switch	86-32	Equalization, Pushbutton Slide Type
M20	Switch	86-33	Selector, Pushbutton Slide Type
M21	Switch	86-34	Roll-Off, Pushbutton Slide Type
M22	Jack	84-46	Auxiliary
M23	Jack	84-47	Microphone

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)





SELECTOR SWITCH SLIDE TYPE (M7) MECHANICALLY COUPLED TO ROTARY SELECTOR SWITCH (M6)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BA6	1.6meg	0Ω	0Ω	.1Ω	†590Ω	†12K	1Ω		
V2	6U8	†10K	1meg	† 12K	0Ω	.1Ω	†1100Ω	0Ω	1.5Ω	6800Ω ◓22K
V3	12AT7	†120Ω	510K	3200Ω	.1Ω	.1Ω	†470K	1meg	4300Ω	0Ω
V4	6BA6	1.3meg	0Ω	0Ω	.1Ω	†1100Ω	†12K	68Ω		
V5	6BA6	1.2meg	0Ω	0Ω	.1Ω	†1100Ω	†12K	68Ω		
V6	6AU6	150K	0Ω	0Ω	.1Ω	†45K	†45K	0Ω		
V7	6AU6	39K	0Ω	0Ω	.1Ω	†39K	†39K	0Ω		
V8	6AL5	80K	70K	0Ω	.1Ω	0Ω	0Ω	70K		
V9	12AU7	†45K	0Ω	1500Ω	20K	20K	†5700Ω	480K	10K	20K
V10	5Y3GT	NC	¶	NC	72Ω	NC	76Ω	NC	¶	

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
◓ MEASURED IN "AM" POSITION.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 8 OF V10.
▲ MEASURED FROM PIN 8 OF V9
NC NO CONNECTIONS

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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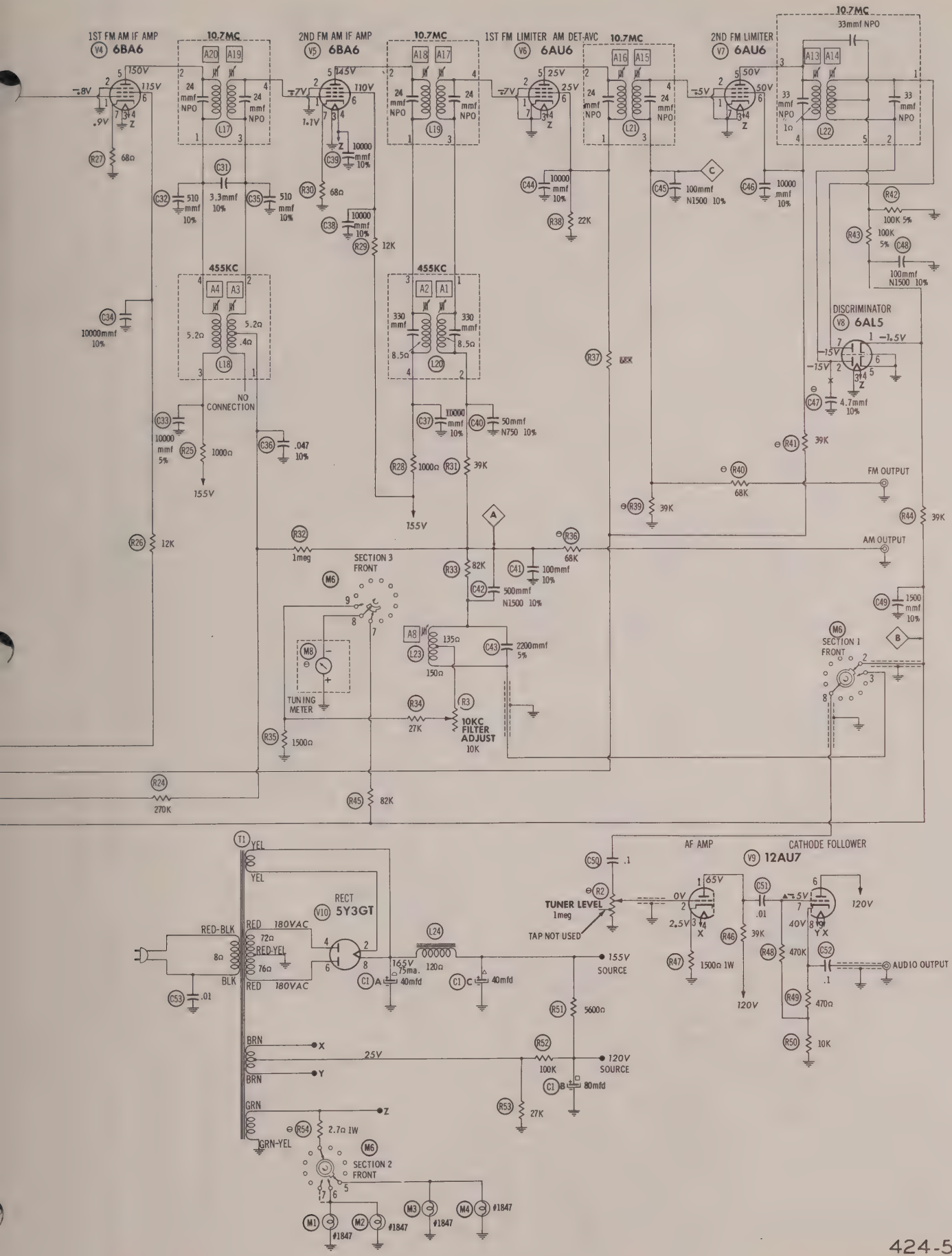

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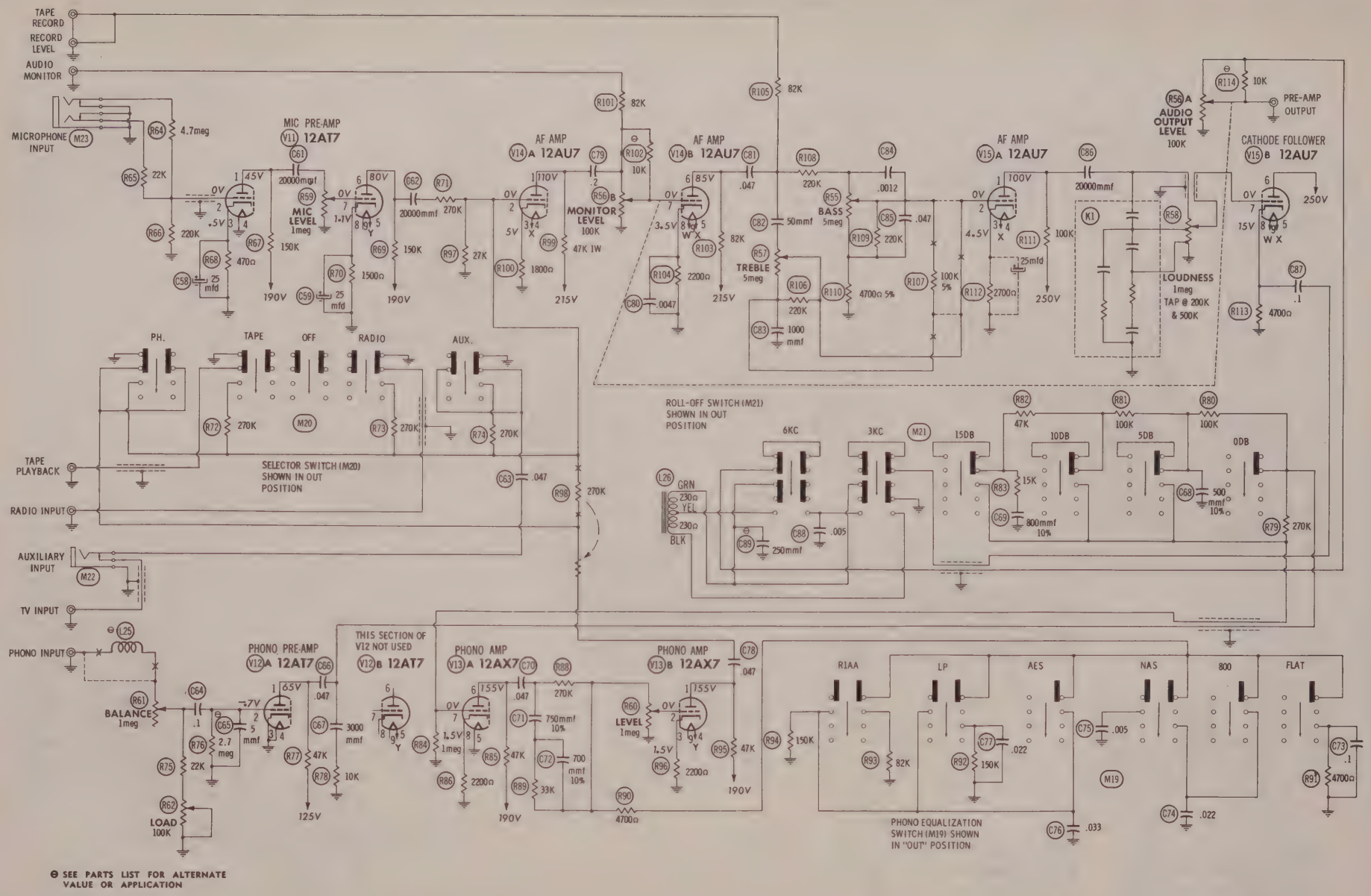
TUNER SCHEMATIC



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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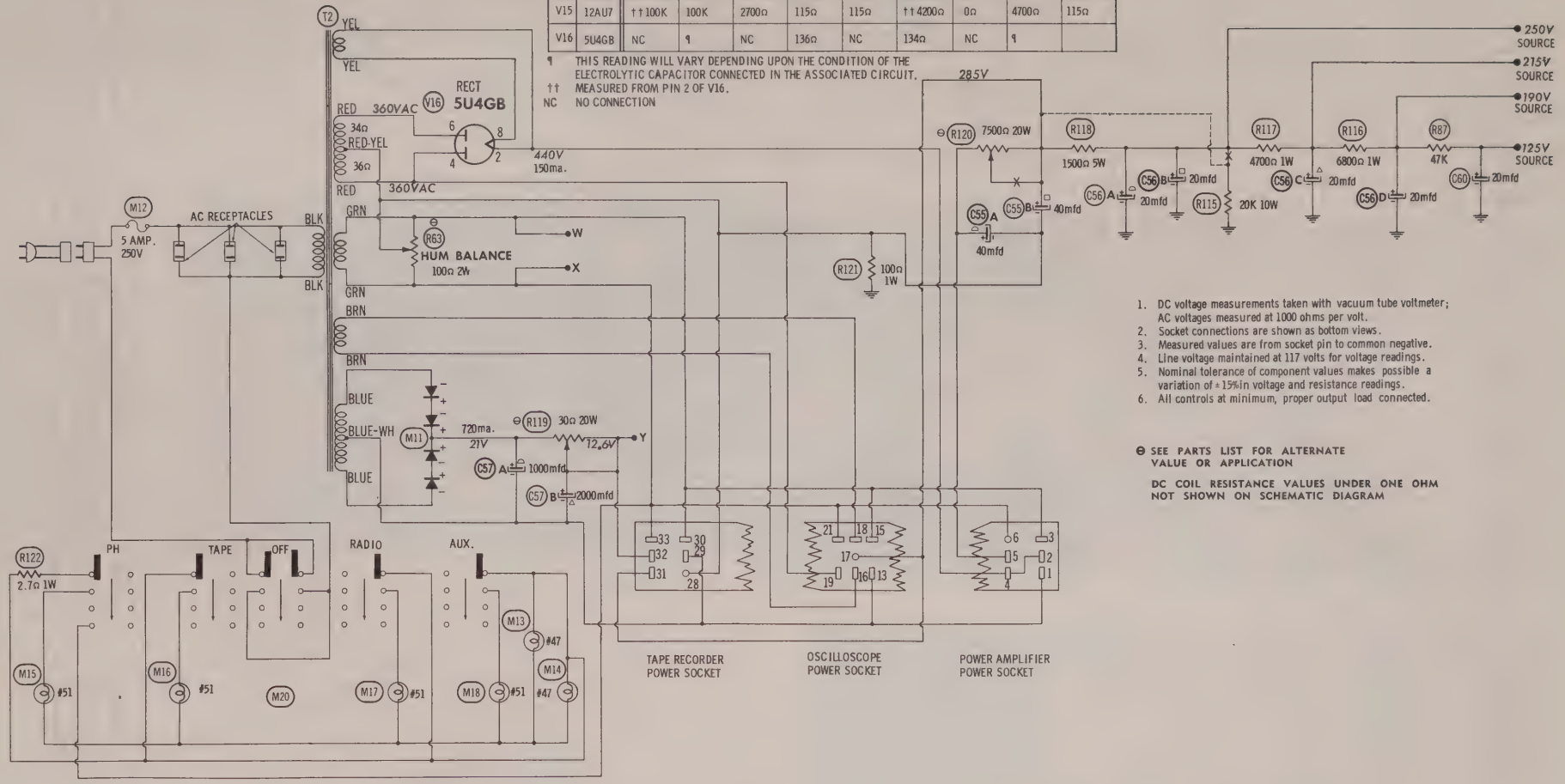
PREAMP SCHEMATIC

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V11	12AT7	††160K	20K	470Ω	0Ω	2.5Ω	††160K	0Ω	1500Ω	3.5Ω
V12	12AT7	††105K	2.7meg	0Ω	2.5Ω	0Ω	NC	NC	NC	3.5Ω
V13	12AX7	††58K	0Ω	2200Ω	2.5Ω	0Ω	††58K	1meg	2200Ω	3.5Ω
V14	12AU7	††53K	27K	1800Ω	115Ω	115Ω	††88K	0Ω	2200Ω	115Ω
V15	12AU7	††100K	100K	2700Ω	115Ω	115Ω	††4200Ω	0Ω	4700Ω	115Ω
V16	5U4GB	NC	¶	NC	136Ω	NC	134Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
†† MEASURED FROM PIN 2 OF V16.
NC NO CONNECTION



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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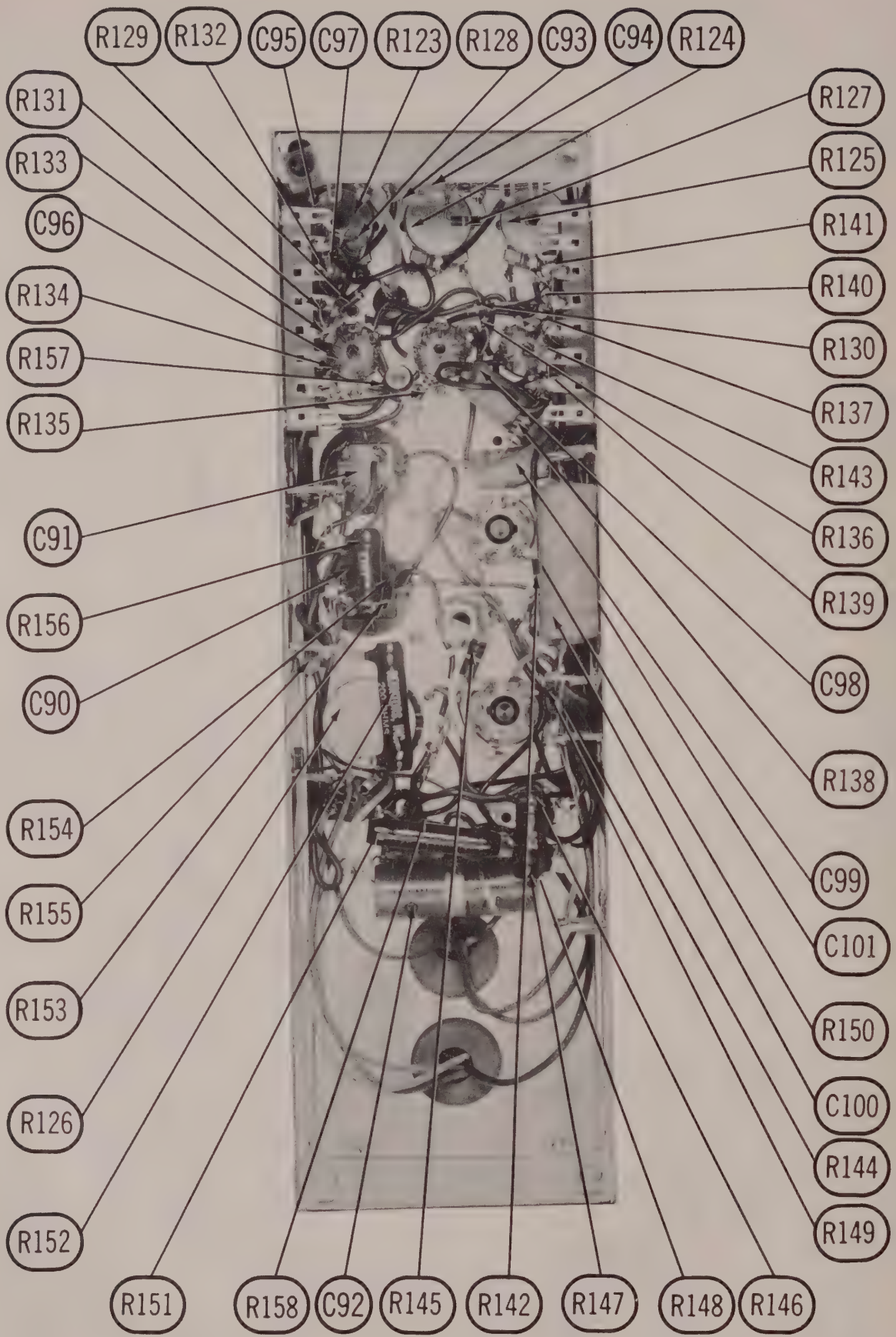
PREAMP POWER SCHEMATIC

COLUMBIA RECORDS
MODEL 836



AMP CHASSIS - BOTTOM VIEW

AMP PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V17	Preamplifier	12AU7	
V18	Phase Inverter - Feedback Amp.	12AU7	
V19	Driver	12AU7	
V20	Output	6L6GB	Note 1
V21	Output	6L6GB	Note 1

Note 1. Type 5881 used in Chassis 523-S-1 (20 Watt Amp.).

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	Columbia Records PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C90A	▲40	500	98-39	AFH2-72	B0530	FP288	TMD-62	D-275	TVL-2940
B	▲40	500							
C91A	▲20	450	98-10	AFH4-14	D0130	FP444	TMQ-12	Q-040	TVL-4763
B	20	450							
C	■20	450							
D	▲20	450							
C92	100	50	98-43	PRS50V100	BR1005	TC3501	TD-100-50	MTH-5010	TVA-1310

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	Columbia Records PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C93	.05	150	98-59	P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C94	.05	150	98-59	P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C95	.1	400	98-42	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C96	40		98-44	1469-00004		22R5Q4	MCE223	MS-44	5% ①
C97	40		98-44	1469-00004		22R5Q4	MCE223	MS-44	5%
C98	.1	400	98-42	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C99	.1	400	98-42	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C100	.2	600	98-23	P688N-2		CUB6P2	GEM-602	6TM-P2	
C101	.2	600	98-23	P688N-2		CUB6P2	GEM-602	6TM-P2	

① Not used in some versions.

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	Columbia Records PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R123A	100K	½	99-101 ①	AB-40	A47-100K-S	Q11-128	SU-41	Input Level
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R124A	50K	½	99-184 ②	AB-31	A47-50K-S	Q11-123	SU-35	Signal Balance
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R125A	100K	½	99-101	AB-40	A47-100K-S	Q11-128	SU-41	Damping
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R126A	100Ω	2(WW)	99-96	WN-101	A43-100	W11-084	R100L	Current Balance
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req.	

① Part #99-91 may be used in some versions. ② Part #99-95 may be used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Columbia Records PART No.	NOTES
R127	100K		99-8	
R128	82K	2	99-11	
R129	2200Ω		99-56	
R130	3300Ω		99-100	
R131	470K		99-17	
R132	220K		99-1	
R133	3300Ω		99-100	
R134	47K		99-20	Note 1
R135	47K		99-20	
R136	27K		99-90	
R137	470K		99-17	
R138	470K	1		Note 2
R139	100K		99-8	
R140	4700Ω	1	99-97	
R141	470K		99-17	
R142	470K	1		Note 2
R143	100K		99-8	
R144	220K		99-1	
R145	10Ω	1	99-151	
R146	250Ω	5(WW)		Note 3
R147	100Ω	5(WW)	99-99	
R148	100Ω	5(WW)	99-99	
R149	220K		99-1	
R150	10Ω	1	99-151	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	Columbia Records PART No.	NOTES
R151	1Ω	10(WW)	99-92	
R152	200Ω	10(WW)	99-128	Note 4
R153	10K	5(WW)	99-94	
R154	6K	5(WW)	99-118	
R155	33K	1		Note 2
R156	3300Ω	5(WW)	99-93	
R157	3300Ω	5(WW)	99-93	
R158	100Ω	1	99-119	

Note 1. Some versions may use 27K in this application (Part #99-90).
Note 2. Not used in some versions.
Note 3. Some versions may use 150Ω 10W in this application (Part #99-98).
Note 4. Not used in 20 Watt Amplifier.

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES.	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA Columbia Records PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L27				94-12 ①						

① Used in Chassis 523-S-1 only (20 Watt Amp.)

TRANSFORMER (AUDIO OUTPUT)

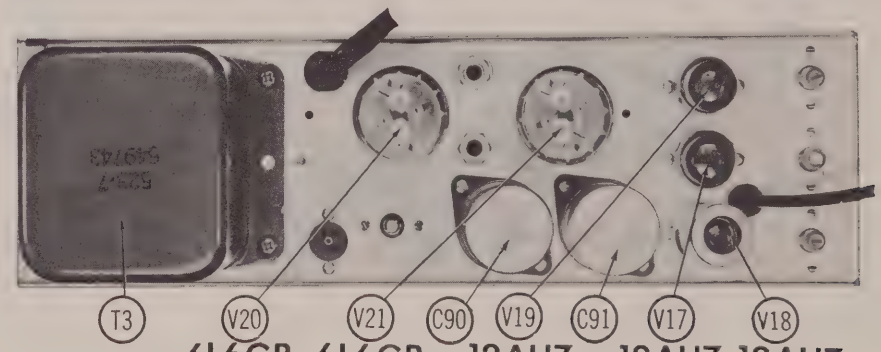
ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Columbia Records PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	6500Ω CT Screen Taps ② 700Ω fromCT	16Ω Tap ③ 8Ω, 4Ω	523-7	H-4111	A-3102			22S39		

SPEAKER

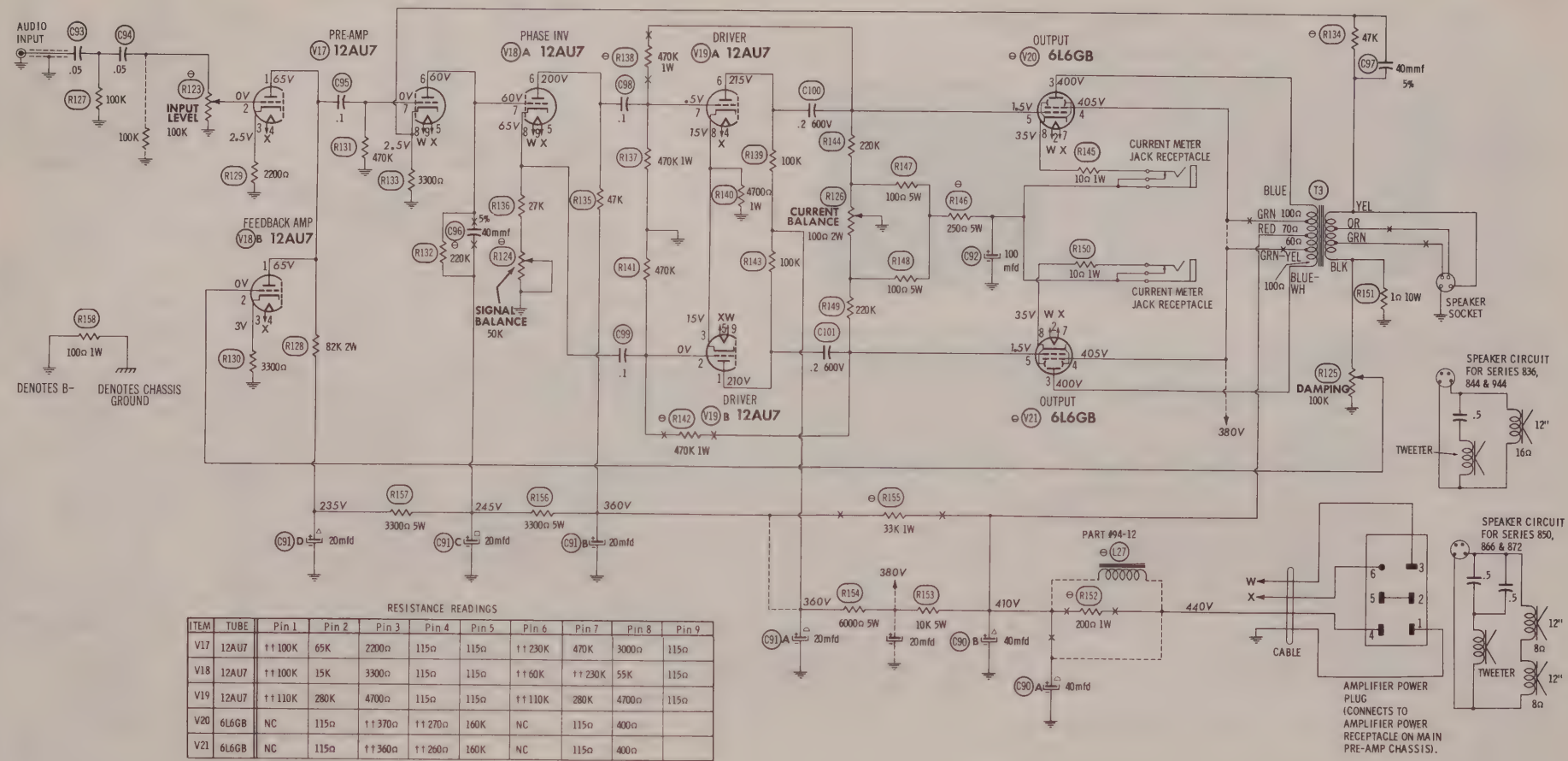
ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA Columbia Records PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	12"	PM	16Ω	836-3 ①	12A10LZ16	① Used in Models 836, 844, 944 only
SP2	12"	PM	6-8Ω	866-13 ②	12A10L	② Connect in series--Models 850, 866, 872 only
SP3	12"	PM	6-8Ω	866-13 ②		③ Horn Tweeter, used in all Models.
SP4	3" X 7"	PM	16Ω	836-1 ③		

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors



AMP CHASSIS—TOP VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V17	12AU7	††100K	65K	2200Ω	115Ω	115Ω	††230K	470K	3000Ω	115Ω
V18	12AU7	††100K	15K	3300Ω	115Ω	115Ω	††60K	††230K	55K	115Ω
V19	12AU7	††110K	280K	4700Ω	115Ω	115Ω	††110K	280K	4700Ω	115Ω
V20	6L6GB	NC	115Ω	††370Ω	††270Ω	160K	NC	115Ω	400Ω	
V21	6L6GB	NC	115Ω	††360Ω	††260Ω	160K	NC	115Ω	400Ω	

†† MEASURED FROM PIN 2 OF V16.
NC NO CONNECTION

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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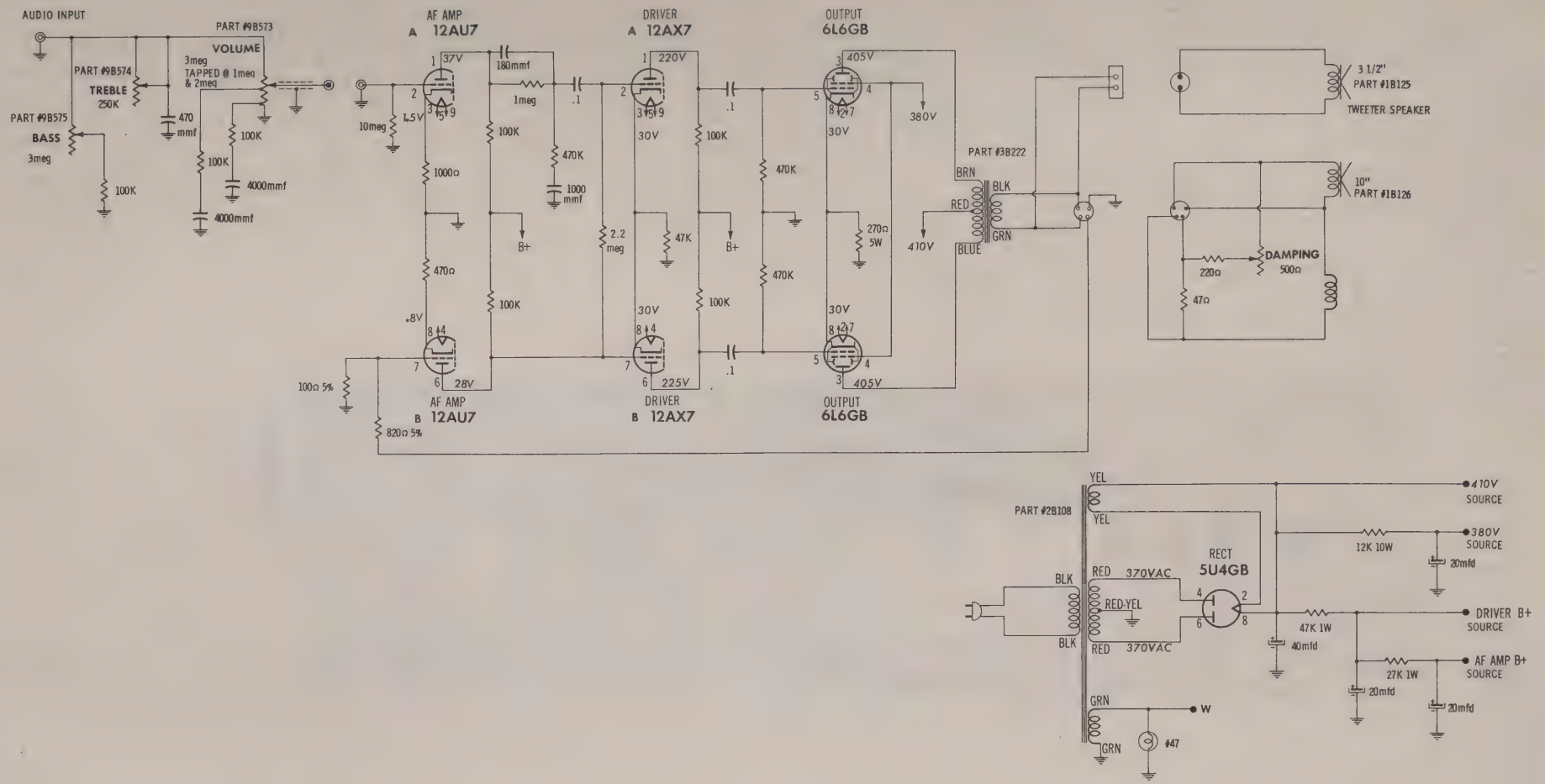
AMP SCHEMATIC



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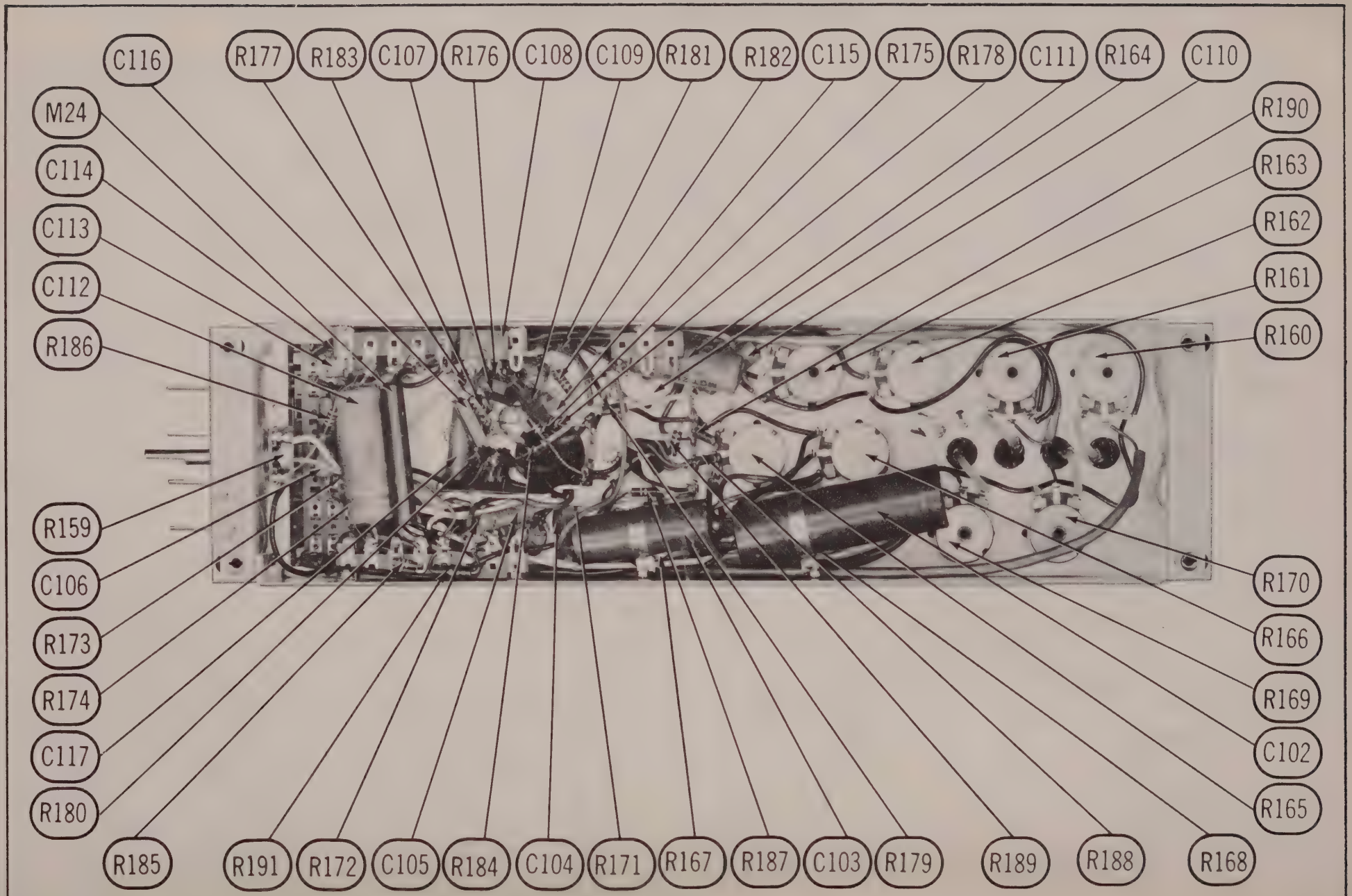
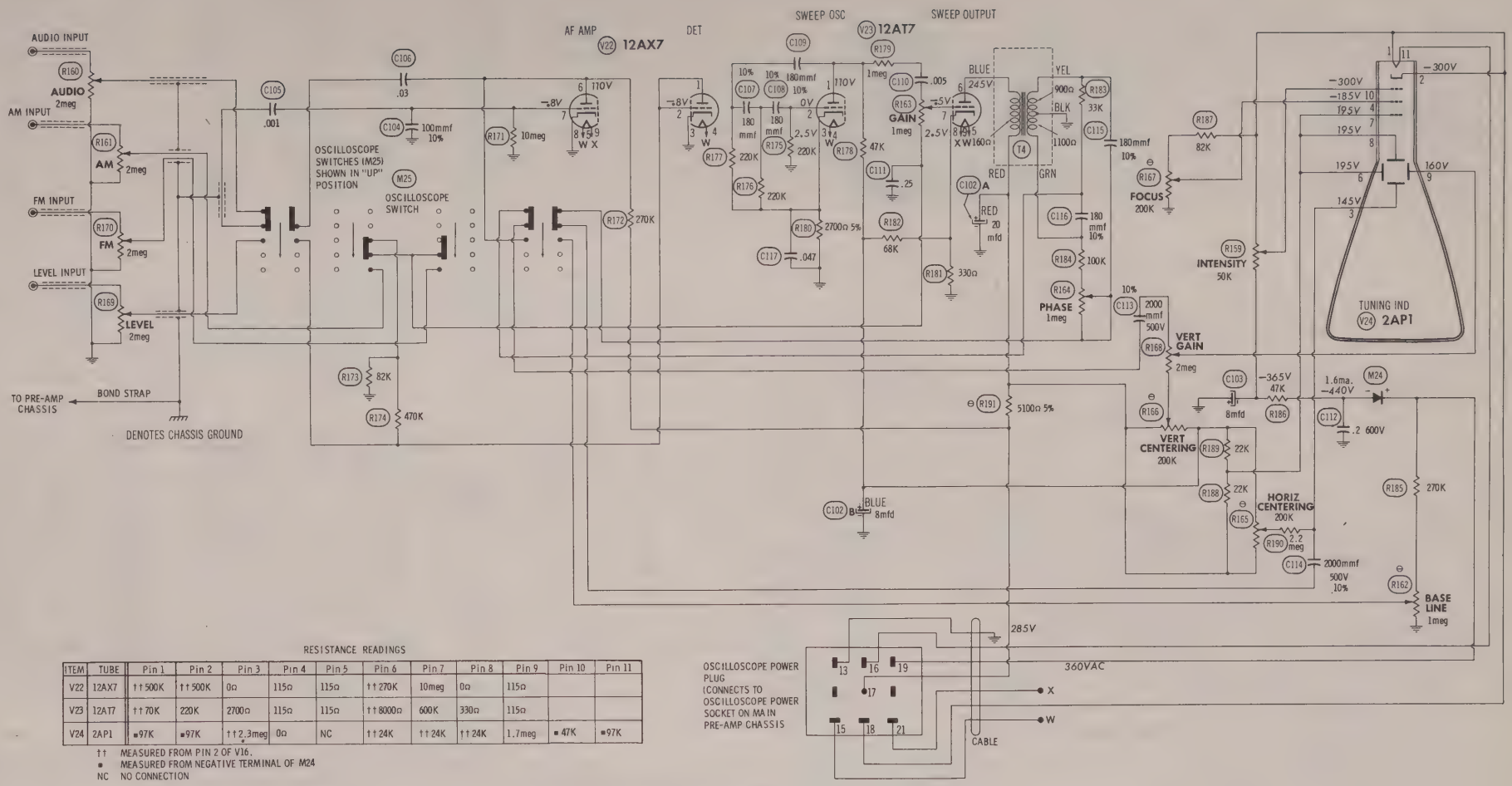
CHANNEL "B" AMP SCHEMATIC

COLUMBIA RECORDS
MODEL 836



OSCILLOSCOPE CHASSIS - BOTTOM VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9	Pin 10	Pin 11
V22	12AX7	††500K	††500K	0Ω	115Ω	115Ω	††270K	10meg	0Ω	115Ω		
V23	12AT7	††70K	220K	2700Ω	115Ω	115Ω	††8000Ω	600K	330Ω	115Ω		
V24	2AP1	•97K	•97K	††2.3meg	0Ω	NC	††24K	††24K	††24K	1.7meg	•47K	•97K

†† MEASURED FROM PIN 2 OF V16.
• MEASURED FROM NEGATIVE TERMINAL OF M24
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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OSCILLOSCOPE SCHEMATIC
MODEL 836
COLUMBIA RECORDS

SCOPE PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V22	AF Amp. - Detector	12AX7	
V23	Sweep Osc. - Sweep Output	12AT7	
V24	Tuning Indicator	2AP1	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Columbia Records PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C102A	20	450		PRS450V101010	BBRT11145		TDLD-25	MTD-308	R2694 *
B	8	450						MT-4504	
C103	8	450		PRS450V8	BR845	TC71	TD-8-450	MT-4508	TVA-1704

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Columbia Records PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C104	100	500	98-12	1469-0001	DD-101	22R5T1	MCB235	MS-31	10%
C105	.001	400	98-54	P488N-001	D6-102	CUB6D1	GEM-421	6TM-D1	
C106	.03	400	98-55	P488N-03	DF-303	CUB6S3	GEM-413	4TM-S3	
C107	180		98-51	1469-00018	DD-181	22R5T18		MS-318	10%
C108	180		98-51	1469-00018	DD-181	22R5T18		MS-318	10%
C109	180		98-51	1469-00018	DD-181	22R5T18		MS-318	10%
C110	.005	400	98-53	P488N-005	D6-502	CUB6D5	GEM-425	6TM-D5	
C111	.25	200	98-41	P288N-25		CUB2P25	GEM-2025	2TM-P25	
C112	.2	600	98-23	P688N-2		CUB6P2	GEM-602	6TM-P2	
C113	2000	500	98-52	1464-002		1R5D2	MCB457	MS-22	10%
C114	2000	500	98-52	1464-002		1R5D2	MCB457	MS-22	10%
C115	180		98-51	1469-00018	DD-181	22R5T18		MS-318	10%
C116	180		98-51	1469-00018	DD-181	22R5T18		MS-318	10%
C117	.047	200	98-20	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Columbia Records PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R159A	50K	½	509-13	B-31	A47-50K-S	Q11-123	U35	Intensity
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R160A	2meg	½	99-110	AB-75	A47-2meg-S	Q11-139	SU-65	Audio
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R161A	2meg	½	99-110	AB-75	A47-2meg-S	Q11-139	SU-65	AM
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R162A	1meg	½	99-178 ①	AB-69	A47-1meg-S	Q11-137	SU-54	Base Line
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R163A	1meg	½	99-105	AB-69	A47-1meg-S	Q11-137	SU-54	Gain
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R164A	1meg	½	99-105	AB-69	A47-1meg-S	Q11-137	SU-54	Phase
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R165A	200K	½	99-177 ②	AB-46	A47-200K-S	Q11-129	SU-46	Horiz. Cent.
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R166A	200K	½	99-177 ②	AB-46	A47-200K-S	Q11-129	SU-46	Vert. Cent.
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R167A	200K	½	99-177 ②	AB-46	A47-200K-S	Q11-129	SU-46	Focus
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R168A	2meg	½	99-179	AB-75	A47-2meg-S	Q11-139	SU-56	Vert. Gain
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R169A	2meg	½	99-110	AB-75	A47-2meg-S	Q11-139	SU-56	Level
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R170A	2meg	½	99-110	AB-75	A47-2meg-S	Q11-139	SU-56	FM
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	

① Alternate Part #99-105. ② Alternate Part #99-104.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Columbia Records PART No.	NOTES
	OHMS	WATT		
R171	10meg		99-6	
R172	270K		99-114	
R173	82K		99-11	
R174	470K		99-17	
R175	220K		99-1	
R176	220K		99-1	
R177	220K		99-1	
R178	47K		99-20	
R179	1meg		99-10	
R180	2700Ω 5%		99-9	
R181	330Ω		99-116	
R182	68K		99-68	
R183	33K		99-22	
R184	100K		99-8	
R185	270K		99-114	
R186	47K		99-20	
R187	82K		99-11	
R188	22K		99-2	
R189	22K		99-2	
R190	2.2meg		99-122	
R191	5100Ω 5%			Note 1

Note 1. Some versions may use 4700Ω in this application (Part #99-41).

TRANSFORMER (SWEEP)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Columbia Records PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T4	1	: 6.8	509-3						

SELENIUM RECTIFIER

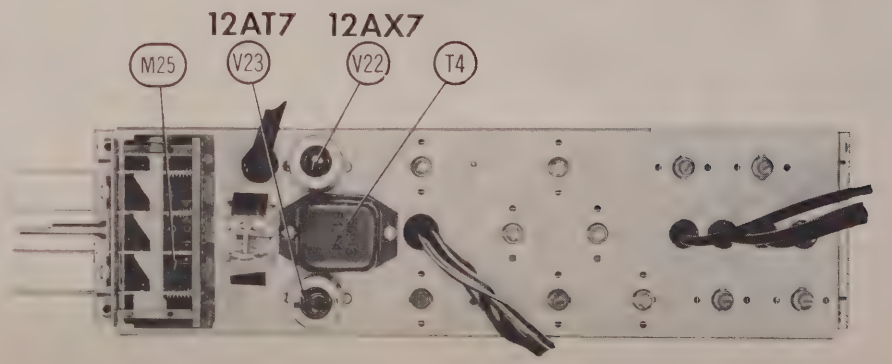
ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	Columbia Records PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M24	.0016A	909-1	5A35P	V50H	026-30H-Q	

MISCELLANEOUS

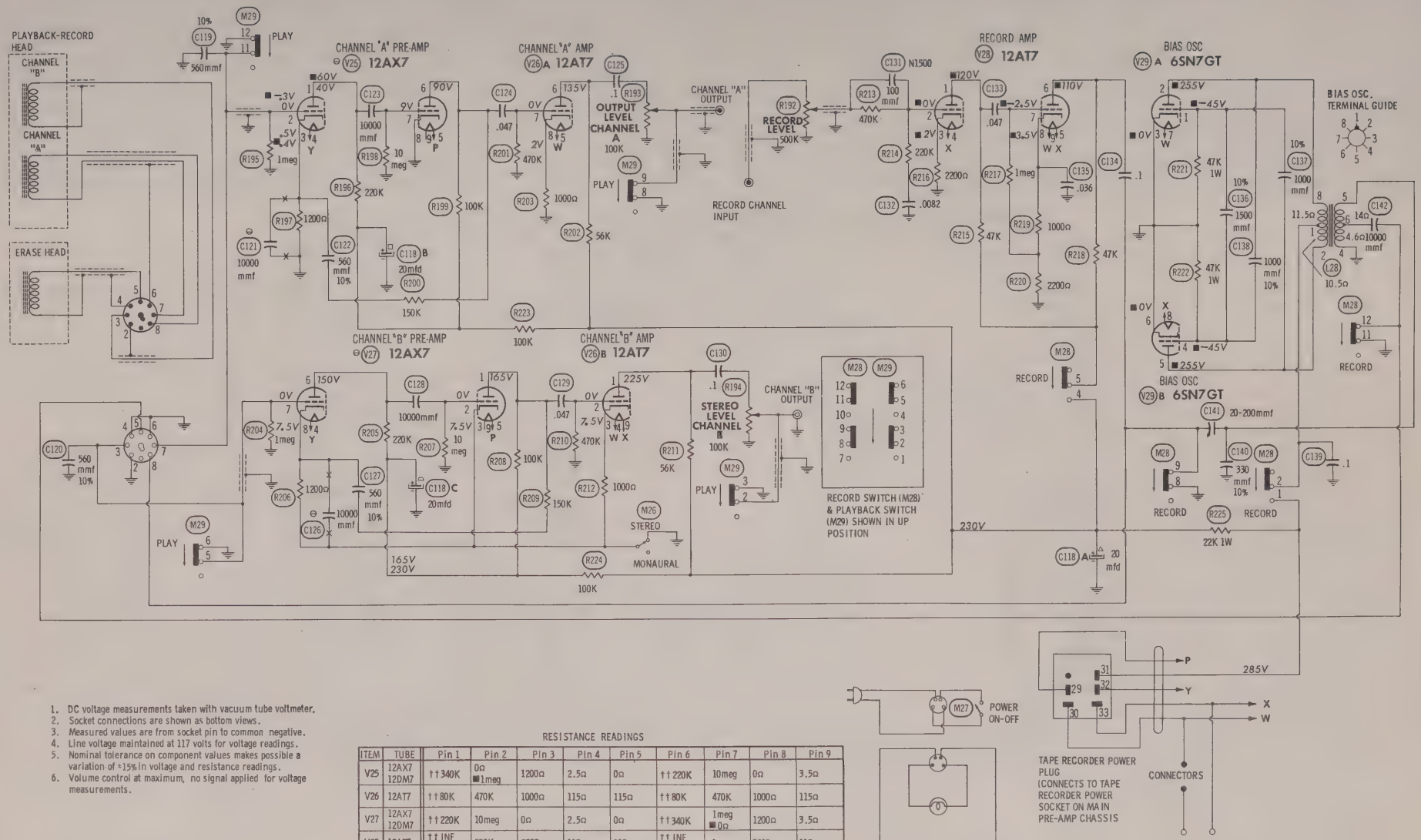
ITEM No.	PART NAME	Columbia Records PART No.	NOTES
M25	Switch	86-28	Scope, Pushbutton Slide Type

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661



SCOPE CHASSIS TOP VIEW



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V25	12AX7 12DM7	††340K	0Ω ■1meg	1200Ω	2.5Ω	0Ω	††220K	10meg	0Ω	3.5Ω
V26	12AT7	††80K	470K	1000Ω	115Ω	115Ω	††80K	470K	1000Ω	115Ω
V27	12AX7 12DM7	††220K	10meg	0Ω	2.5Ω	0Ω	††340K	1meg ■0Ω	1200Ω	3.5Ω
V28	12AT7	†† INF ††■70K	500K	2200Ω	115Ω	115Ω	†† INF ††■70K	1meg	3200Ω	115Ω
V29	6SN7GT	47K	††■3200Ω	0Ω	47K	††■3200Ω	0Ω	115Ω	115Ω	

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
†† MEASURED FROM PIN 2 OF V16.
■ MEASURED IN "RECORD" POSITION.

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TAPE SCHEMATIC

TAPE PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V25	Channel A Preamplifier	12AX7 or 12DM7
V26	Channel A Amplifier-Channel B Amplifier	12AT7
V27	Channel B Preamp.	12AX7 or 12DM7
V28	Record Amplifier	12AT7
V29	Bias Oscillator	6SN7GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Columbia Records PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C118A	▲20	450	45X442	AFH3-36	C0270	FP376.5	TMT-34	T-140	TVL-3780
B	■20	450							
C	▲20	450							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Columbia Records PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C119	560		80X9		MD-560				10%
C120	560		80X9		MD-560				10%
C121	10000		47X595	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	①
C122	560		80X9		MD-560				10%
C123	10000		47X595	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C124	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C125	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C126	10000		47X595	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	①
C127	560		80X9		MD-560				10%
C128	10000		47X595	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C129	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C130	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C131	100		80X8						N1500
C132	.0082	200		P288N-008			GEM-6282	6TM-D8	
C133	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C134	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C135	.036	200				CUB10S35		6TM-S35	
C136	1500		80X22						10%
C137	1000		47X673						10%
C138	1000		47X673						10%
C139	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C140	330		RCM20B331K	1469-00033	MD-331	5R5T33		MS-333	10%
C141	20-300								
C142	10000		47X595	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	

① Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Columbia Records PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R192A	500K	½	40X438	AB-59	A47-500K-S	Q11-133	SU-50	Record Level
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R193A	100K	½	99-101	AB-40	A47-100K-S	Q11-128	SU-41	Output Level Channel A
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	
R194A	100K	½	99-101	AB-40	A47-100K-S	Q11-128	SU-41	Stereo Level Channel B
B	Shaft			AK-19	FKS-1/4	RQ	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Columbia Records PART No.	NOTES
	OHMS	WATT		
R195	1meg		B84105	
R196	220K		B84224	
R197	1200Ω		B84122	
R198	10meg		B84106	
R199	100K		B84104	
R200	150K		B84154	
R201	470K		B84474	
R202	56K		B84563	
R203	1000Ω		B84102	
R204	1meg		B84105	
R205	220K		B84224	
R206	1200Ω		B84122	
R207	10meg		B84106	
R208	100K		B84104	
R209	150K		B84154	
R210	470K		B84474	

ITEM No.	RATING		Columbia Records PART No.	NOTES
	OHMS	WATT		
R211	56K		B84563	
R212	1000Ω		B84102	
R213	470K		B84474	
R214	220K		B84224	
R215	47K		B84473	
R216	2200Ω		B84222	
R217	1meg		B84105	
R218	47K		B84473	
R219	1000Ω		B84102	
R220	2200Ω		B84222	
R221	47K	1	C84473	
R222	47K	1	C84473	
R223	100K		B84104	
R224	100K		B84104	
R225	22K	1	C84223	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Columbia Records PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L28	Bias Osc.						

MISCELLANEOUS

ITEM No.	PART NAME	Columbia Records PART No.	NOTES
M26	Switch		Stereo-Monaural, Rotary Snap Type
M27	Switch		Power On-Off, Rotary Snap Type
M28	Switch		Record, Slide Type, Spring Return
M29	Switch		Play, Slide Type, Spring Return

TAPE PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	Columbia Records PART No.	NOTES
M30	Timer Ass'y	519-9	

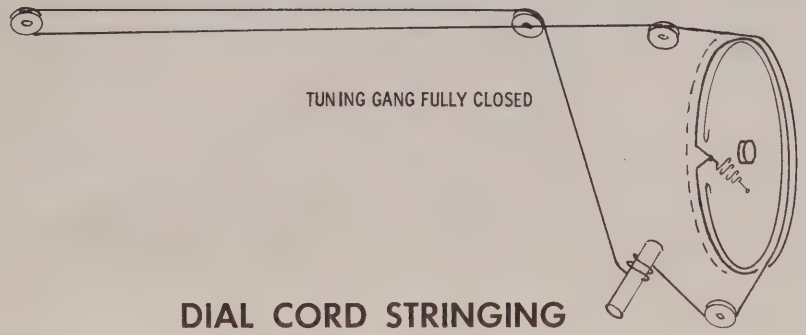
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Panel	515-55	Front
Dial Pointer	515-61	
FM Scale	515-47	
AM Scale	515-49	
Indicator	507-69	Visatone
Button	92-16	Scope Switch, Four used
Knob	8140	Tape Speed
Knob	8649	Tape Control
Knob	8048	Pause, Monitor

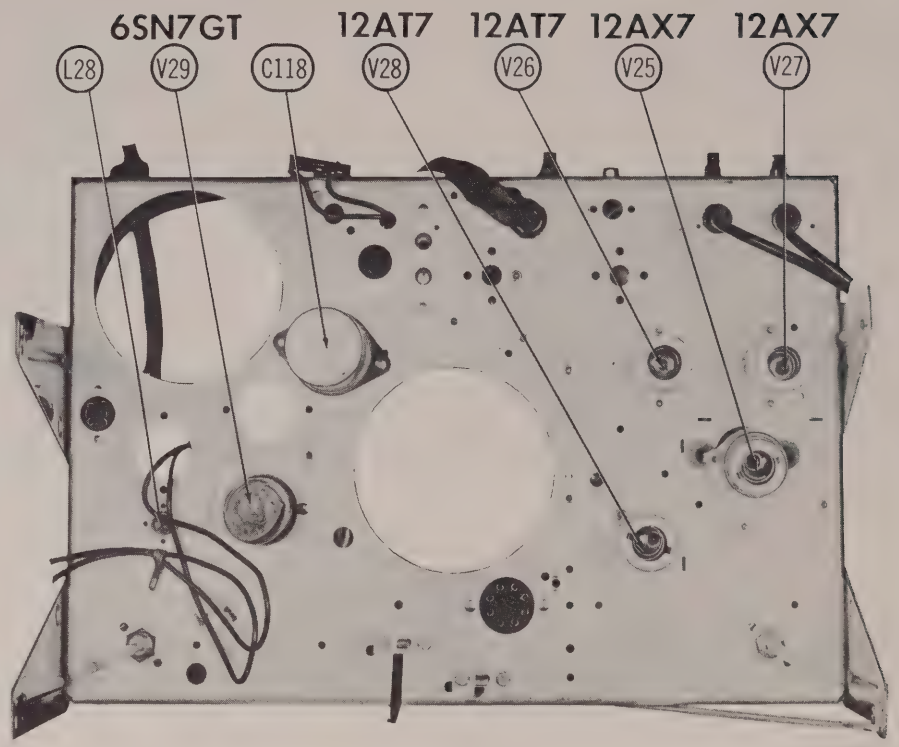
WIRING DATA

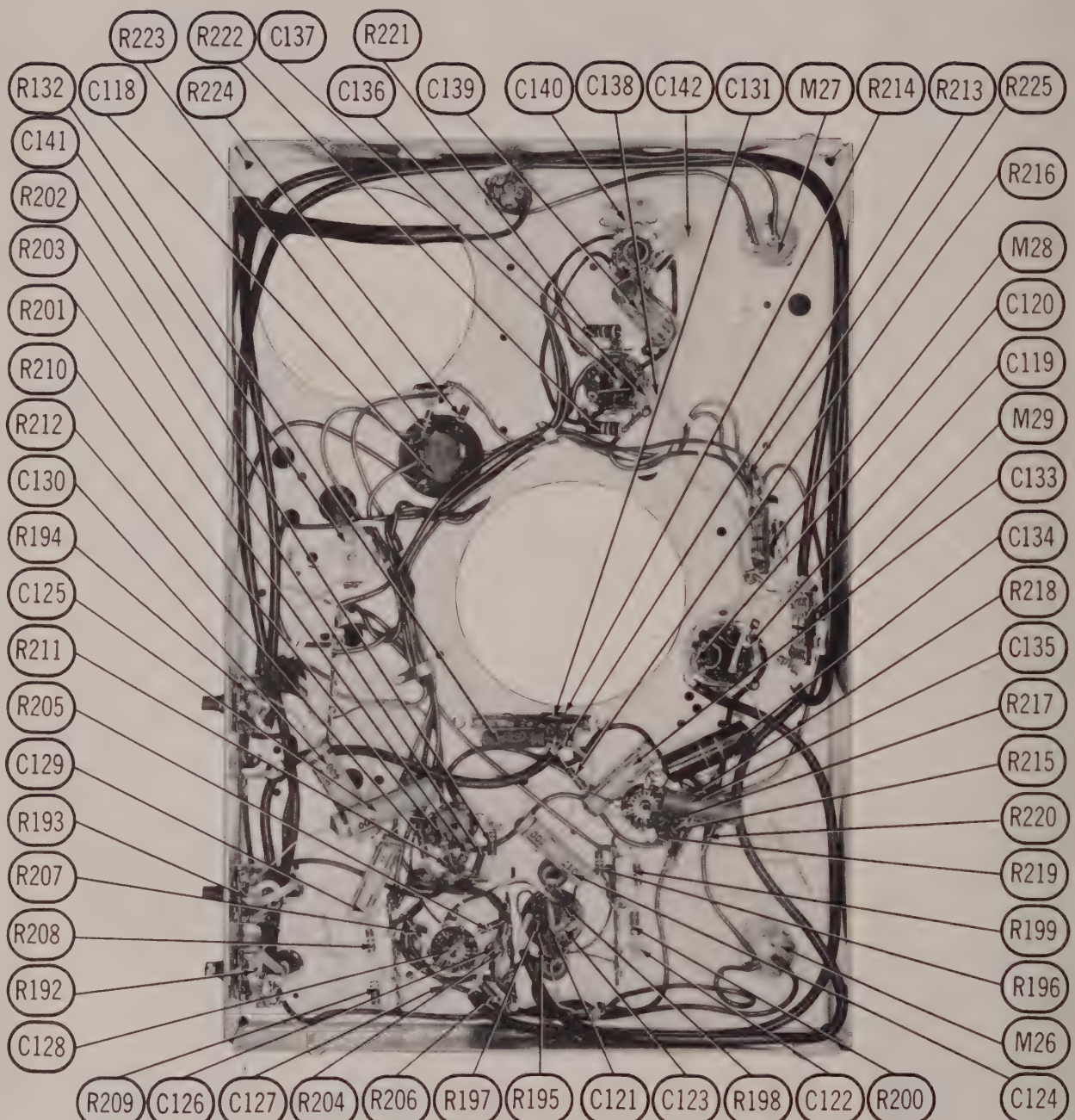
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



DIAL CORD STRINGING

TAPE CHASSIS—TOP VIEW





TAPE CHASSIS - BOTTOM VIEW

PHOTOFACT* Folder

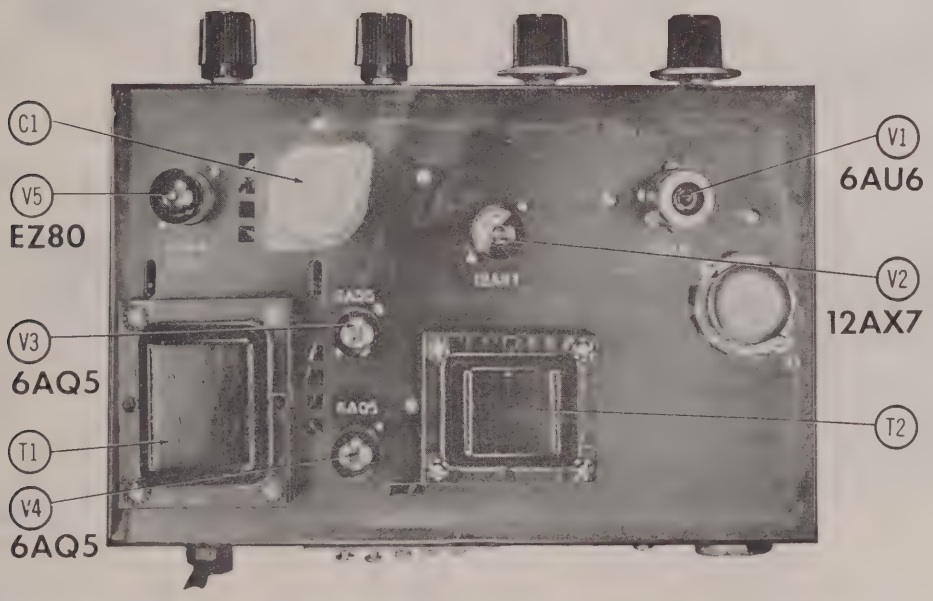
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

DAVID BOGEN
MODEL K10

DAVID BOGEN
MODEL K10

TRADE NAME	David Bogen Model K10
MANUFACTURER	David Bogen Co., P. O. Box 500, Paramus, N. J.
TYPE SET	AC Operated 2 Channel 10 Watt Audio Amplifier
TUBES (Five)	Types 6AU6 Mic Preamplifier, 12AX7/ECC83 AF Amp.-Phase Inv., (2) 6AQ5 Output, EZ80/6BW4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .47 Amp. @ 117 Volts AC (45 Watts)

DAVID BOGEN
MODEL K10



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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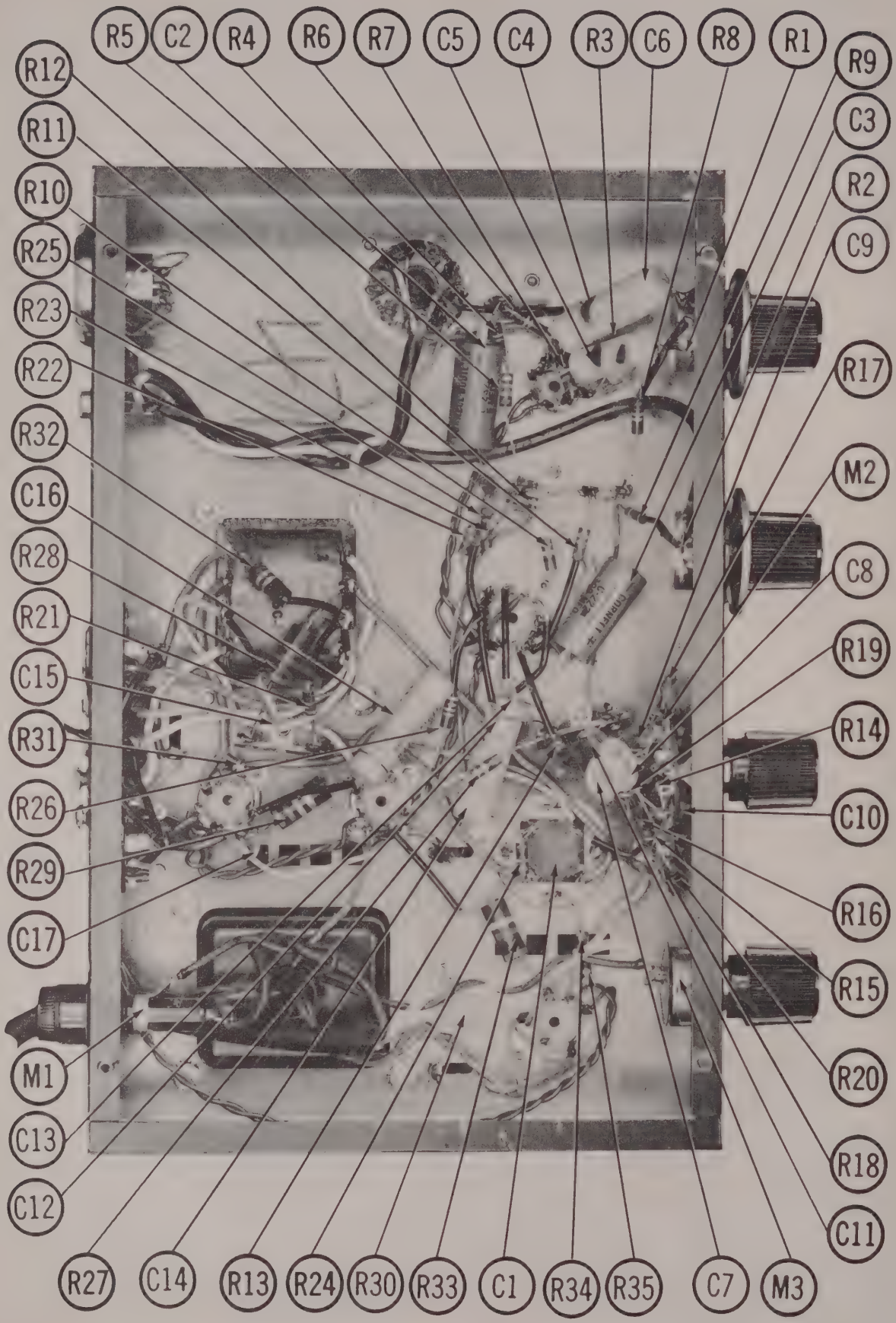
SET 424 FOLDER 6



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS (Continued)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Mic Preamplifier	6AU6	
V2	AF Amp. - Phase Inv.	12AX7/ ECC83	
V3	Output	6AQ5	
V4	Output	6AQ5	
V5	Rectifier	EZ80/6BW4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	David Bogen PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲30	350		AFH4-17	D0504		TMQ-53	Q-200	R2693 *
B	■5	350			BR1635		TD-10-450	MT-4510	
C	▲5	350							
D	10	25							
C2	5	200		PRS250V4	BBR4-250	TC50X	TD-4-450	MT-4504	TVA-1501
C3	100	6		PRS6V100	BBR100-6	TC2501	TD-100-6	MTH-0610	TVA-1101

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	.033	200		P288N-033	DF-303	CUB6S33	GEM-4133	6TM-S33	
C5	.033	200		P288N-033	DF-303	CUB6S33	GEM-4133	6TM-S33	
C6	.1	200		P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C7	2200								10%
C8	3300								10%
C9	.0068	400		P488N-0068	D6-682	CUB6D68	GEM-6268	6TM-D68	
C10	.0068	400		P488N-0068	D6-682	CUB6D68	GEM-6268	6TM-D68	
C11	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C12	33			NPO-DI 33	DD-330	L10Q33	ZT-5433	5TCC-Q33	10%
C13	47			NPO-DI 47	DD-470	L10Q47		5TCC-Q47	10%
C14	.033	400		P488N-033	DF-303	CUB6S33	GEM-4133	6TM-S33	
C15	3300								10%
C16	.033	400		P488N-033	DF-303	CUB6S33	GEM-4133	6TM-S33	
C17	33			NPO-DI 33	DD-330	L10Q33	ZT-5433	5TCC-Q33	10%

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	David Bogen PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	Mic
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	Phono
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	David Bogen PART No.	NOTES
R3	3.3meg			
R4	220K			
R5	68K			
R6	220K			
R7	68K			
R8	220K			
R9	220K			
R10	100K			
R11	1500Ω			
R12	330Ω			
R13	15K			
R14	470K			
R15	100K			
R16	150K			
R17	22K			
R18	33K			
R19	47K			
R20	10K			

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	David Bogen PART No.	NOTES
R21	4700Ω			
R22	22K			
R23	100K			
R24	10K			
R25	1800Ω			
R26	470K			
R27	100K			
R28	1500Ω	2		
R29	68K	2		
R30	325Ω	7		
R31	470K			
R32	10K	1		
R33	1000Ω	2		
R34	33Ω			
R35	33Ω			

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	David Bogen PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ② .52A	500VCT ② .068A	6.3V ② 2.6A	T3174					22R02 ①	R-5B

① Tape unused winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	David Bogen PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6000Ω CT	500Ω Taps ② 16Ω, 8Ω, 4Ω	T260-1							

FUSES

ITEM No.	TYPE	RATING	David Bogen PART No. FUSE	David Bogen PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	1½A 125V S/B			31301.5 (1½A 125V S/B)	342001	MDX1½	HKP

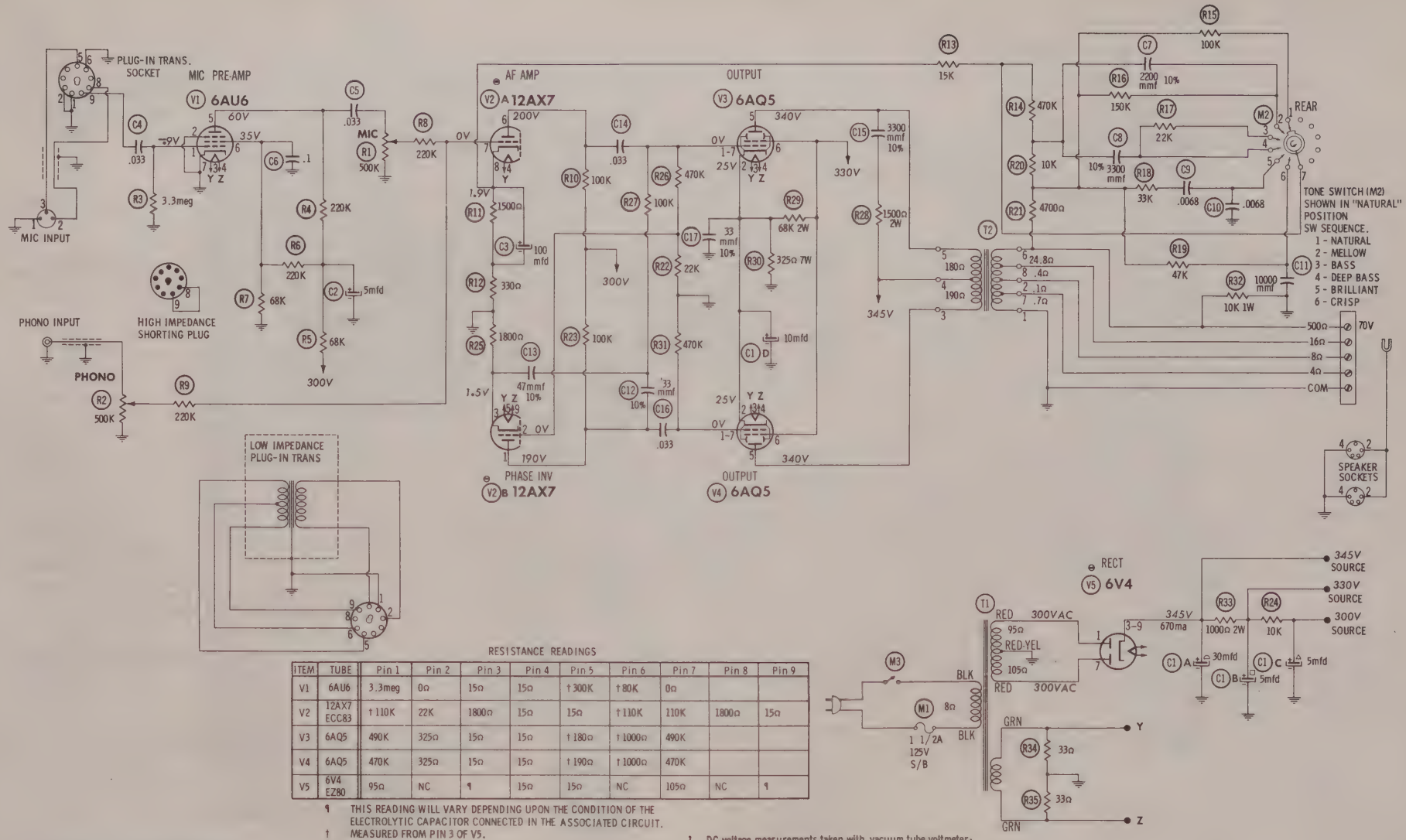
MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M2	Switch	S500A	Single Pole 6 Position Single Wafer Rotary
M3	Switch	S434	Power On-Off, SPST Snap Rotary

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AU6	3.3meg	0Ω	15Ω	15Ω	†300K	†80K	0Ω		
V2	12AX7 ECC83	†110K	22K	1800Ω	15Ω	15Ω	†110K	110K	1800Ω	15Ω
V3	6AQ5	490K	325Ω	15Ω	15Ω	†180Ω	†1000Ω	490K		
V4	6AQ5	470K	325Ω	15Ω	15Ω	†190Ω	†1000Ω	470K		
V5	6V4 EZ80	95Ω	NC	¶	15Ω	15Ω	NC	105Ω	NC	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 3 OF V5.
NC NO CONNECTION

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

FISHER
MODEL 90-C

FISHER
MODEL 90-C

FISHER
MODEL 90-C

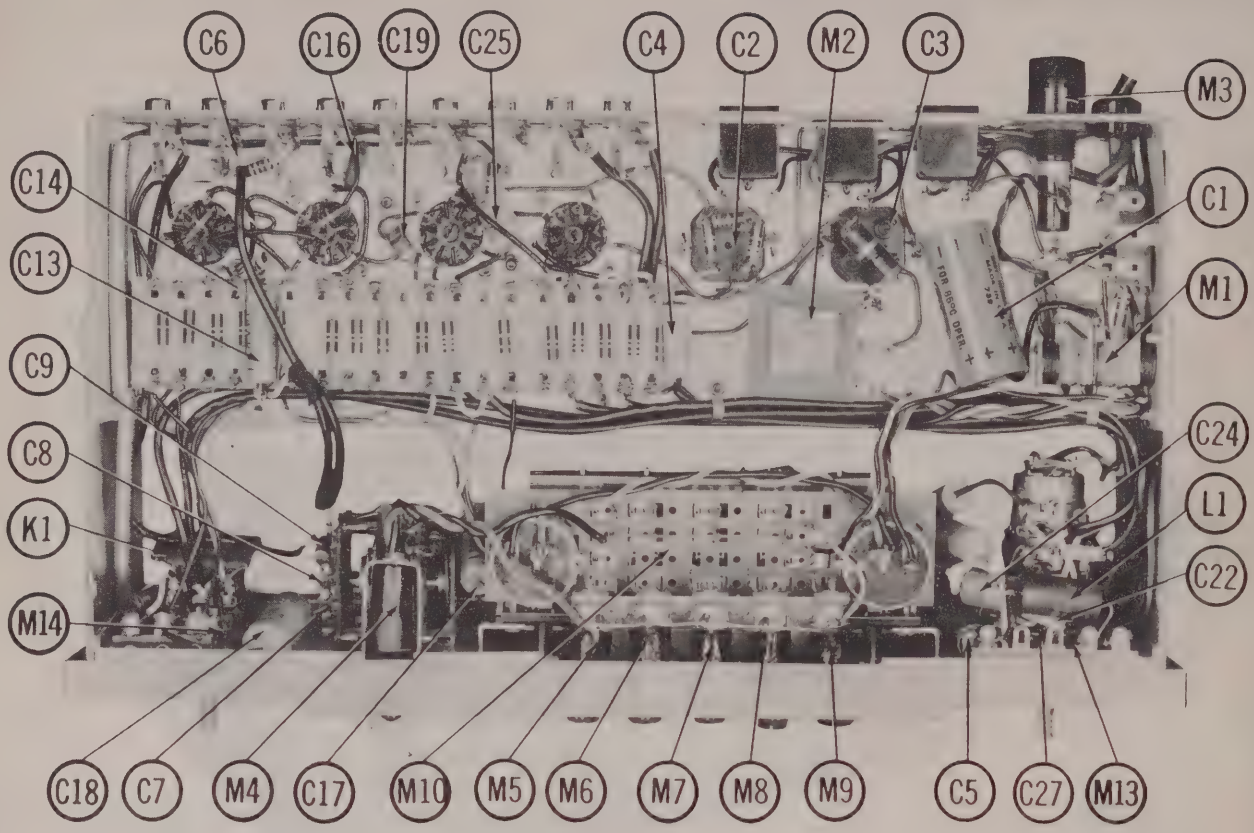
TRADE NAME	Fisher Model 90-C (Serial #10001-19999 Inclusive)
MANUFACTURER	Fisher Radio Corp., 21-21 44th Drive, Long Island City 1, N. Y.
TYPE SET	AC Operated 7 Channel Audio Preamplifier
TUBES (Four)	Types 12AX7 Phono Preamplifier, 12AX7 Mic Preamp.-AF Amp., 12AX7 AF Amplifier, 12AU7 Cathode Follower
POWER SUPPLY	105-125 Volts AC-50/60 Cycles RATING .23 Amp. @ 117 Volts AC (24 Watts)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

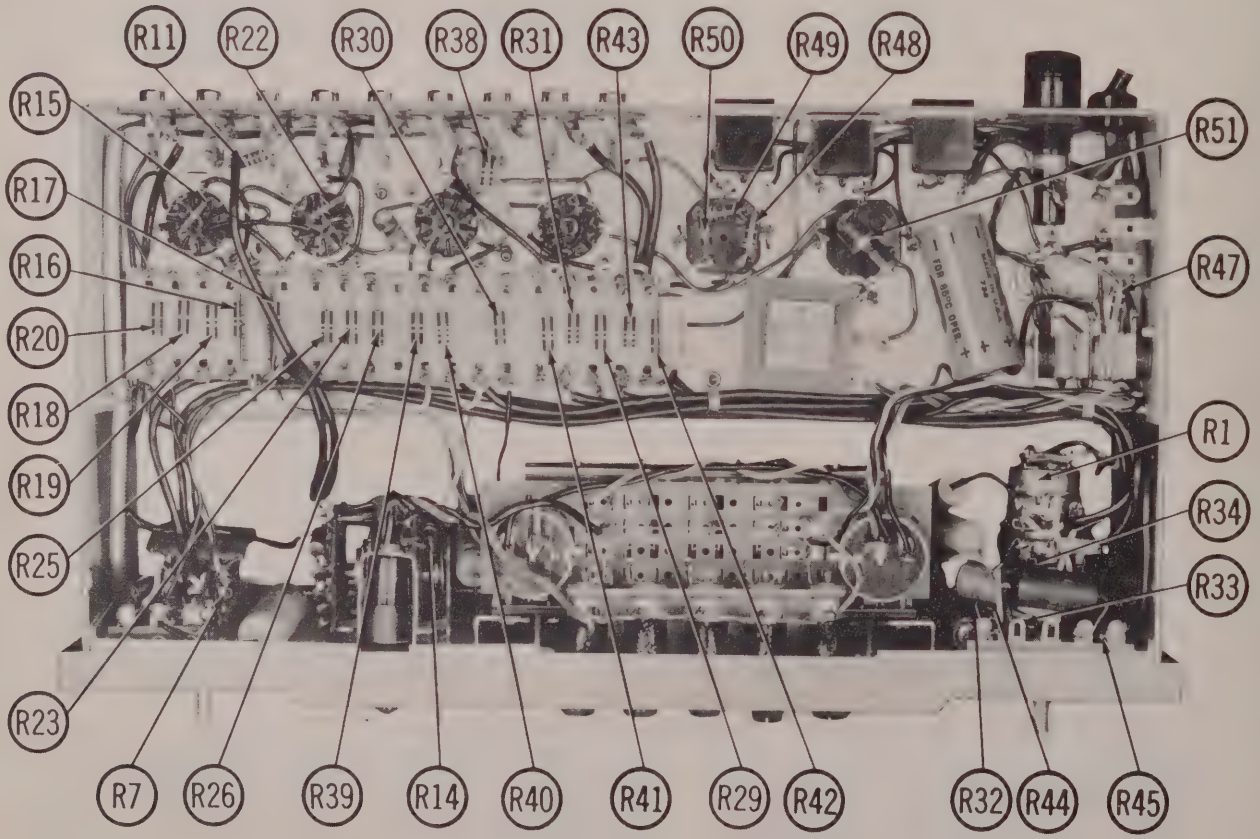
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

H705

SET 424 FOLDER 7



CHASSIS BOTTOM VIEW - CAPACITOR & MISC IDENT.



CHASSIS BOTTOM VIEW - RESISTOR IDENT

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Phono Preamplifier	12AX7	
V2	Mic PreAmp. -AF Amp.	12AX7	
V3	AF Amplifier	12AX7	
V4	Cath. Follower	12AU7	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	FISHER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	10	350	C-546-133	PRS350V10	BR1045	TC62	TD-10-450	MT-4510	TVA-1604
C2A	40	350	C-546-115		D0020				R2446 *
B	▲40	250			BR4025				
C	■40	250							
D	▲40	250							
C3A	▲1000	30	C-546-116						R2619 *
B	▲1000	30							
C4	25	6	C-556-137	PWE6025	NL25-6	TT6X25	ML30-6	MQ-0225	TE-1091
C5	1	250	C-546-126	PRS450V1	BR145	TT250X1		MMT-4501	R2702 *

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

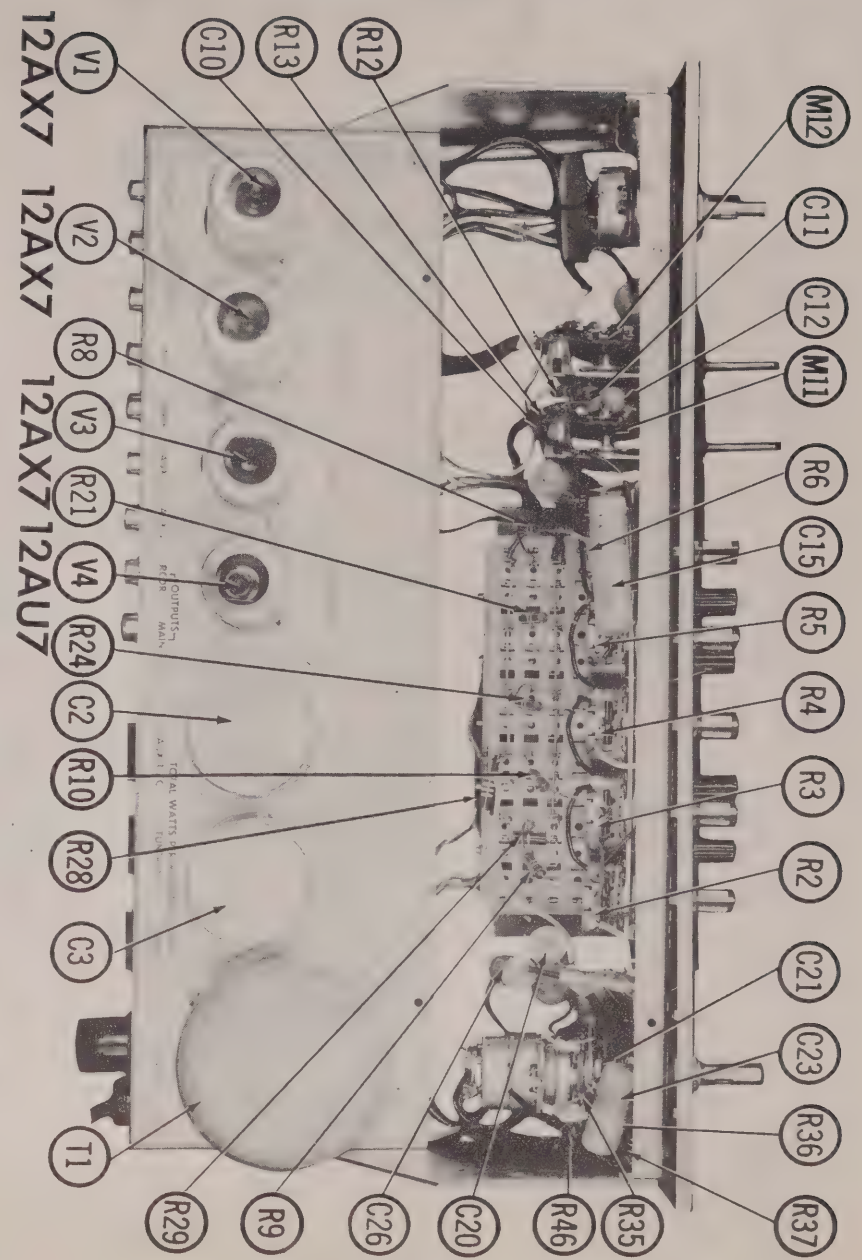
ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	FISHER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	100		CC21GP101M5	SI100	D6-101	LT6T1	UC-531	5GA-T1	
C7	440		CC21GP441K5						10%
C8	120		CC21GP121K5	NPO-SI120	D6-121	L10T12		MS-312	10%
C9	220		CC21GP221K5	NPO-SI220	D6-221	L10T22		MS-322	10%
C10	720		CC21GP721K5						10%
C11	.0033	200	C68P332K2				GEM-16233		10%
C12	.0022	200	C68P222K2				GEM-16222		10%
C13	.02	200	C68P203M2	P288N-02	DD-203	CUB2S2	GEM-412	4TM-S2	
C14	10000		CK62GP103V6	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C15	.047	400	C68P473M4	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C16	10000		CK62GP103V6	BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C17	.047	400	C68P473M4	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C18	.1	400	C68P104M4	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C19	300		CC21GP301K5		D6-301	L10T3		MS-33	10%
C20	.1	200	C68P104V2	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C21	470		CC21GP471K5		D6-471	L10T47		MS-347	10%
C22	1000		C26GP102K5			1R5D1	MCB255	MS-21	10%
C23	.02	200	C68P203K2				GEM-1612		10%
C24	.02	200	C68P203K2				GEM-1612		10%
C25	.0068	200	C68P682K2				GEM-16268		10%
C26	.047	200	C68P473K2						10%
C27	.0022	200	C68P222K2				GEM-16222		10%

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	FISHER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	Switch		RS-546-152CX					Loudness Contour
B	100K	½						Master Volume, Taps @ 37.5K & 62.5K
C	25K	½						Master Volume, Tap @ 12.5K
D	Switch							Power On-Off
R2A	500K	½	R-50000-13	B-59	A47-500K-S	Q11-133	U50	Aux-1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	500K	½	R-50000-13	B-59	A47-500K-S	Q11-133	U50	Aux-2
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4A	500K	½	R-50000-13	B-59	A47-500K-S	Q11-133	U50	Mic
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R5A	500K	½	R-50000-13	B-59	A47-500K-S	Q11-133	U50	Phono
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R6A	500K	½	R-50000-13	B-59	A47-500K-S	Q11-133	U50	Tuner
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R7A	1meg	½	R-647-111	F1-51			■ UE3850	Bass
B	500K	½		R4-42				Treble, Tap @ 250K

■ "STA-LOC" Equivalent: FA16L, 0S687, RU55T254, IS1062.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	FISHER PART No.	NOTES
R8	220K		RC20BF224K	
R9	220K		RC20BF224K	
R10	220K		RC20BF224K	
R11	47K		RC20BF473K	Note 1
R12	3.3meg		RC20BF335K	
R13	2.2meg		RC20BF225K	
R14	150K		RC20BF154K	
R15	2.2meg		RC20BF225K	
R16	220K		RC20BF224K	
R17	2700Ω		RC20BF272K	
R18	2.2meg		RC20BF225K	
R19	220K		RC20BF224K	
R20	2200Ω		RC20BF222K	
R21	220K		RC20BF224K	
R22	18meg		RC20BF186K	
R23	220K		RC20BF224K	
R24	220K		RC20BF224K	
R25	100K		RC20BF104K	
R26	2700Ω		RC20BF272K	
R27	1meg		RC20BF105K	
R28	390K		RC20BF394K	
R29	220K		RC20BF224K	
R30	2700Ω		RC20BF272K	
R31	47K		RC20BF473K	
R32	10K		RC20BF103K	
R33	15K		RC20BF153K	
R34	10K		RC20BF103K	
R35	10K		RC20BF103K	
R36	15K		RC20BF153K	
R37	10K		RC20BF103K	
R38	470K		RC20BF474K	
R39	100K		RC20BF104K	
R40	390K		RC20BF394K	
R41	220K		RC20BF224K	
R42	2700Ω		RC20BF272K	
R43	47K		RC20BF473K	
R44	2.2meg		RC20BF225K	
R45	10K		RC20BF103K	
R46	47K		RC20BF473K	
R47	3300Ω		RC20BF332K	
R48	3300Ω		RC20BF332K	
R49	3300Ω		RC20BF332K	
R50	10K		RC20BF103K	
R51	15Ω	2	RC40BF105K	

Note 1. Some versions may use 100K in this application (Part #RC20BF104K).

COILS

ITEM No.	USE	REPLACEMENT DATA FISHER PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Tone Choke	L-629-153					1 Henry

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA FISHER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .22A	390VCT @ .007A	24V @ .41A	T-546-114						
	SEC. 3									
	6.3V @ .33A									

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	FISHER PART No.	REPLACEMENT DATA
K1	Tone Compensation		PC-552-105	

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA FISHER PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.007A	SR-3283			026-18C1-Q	
M2	.265A	SR-3078	1016	B1B	304B	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA FISHER PART No. FUSE	FISHER PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3	3AG	½A 250V	F-3297	X-1036	312.500 (½A 250V)	342001	AGC ½	HKP

MISCELLANEOUS

ITEM No.	PART NAME	FISHER PART No.	NOTES
M4	Lamp	1-50009-2	#51
M5	Lamp	1-50009-2	#51
M6	Lamp	1-50009-2	#51
M7	Lamp	1-50009-2	#51
M8	Lamp	1-50009-2	#51
M9	Lamp	1-50009-2	#51
M10	Switch Ass'y.	S-546-133	Five Channel Selector, Slide Type
M11	Switch	S-50022-4	High Frequency Rolloff Equalization, Rotary, Wafer Type
M12	Switch	S-50022-5	Low Frequency Turnover Equalization, Rotary, Wafer Type
M13	Switch	S-629-155	Presence, SPST, Slide Type
M14	Switch	S-629-155	Rumble Filter, SPST, Slide Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

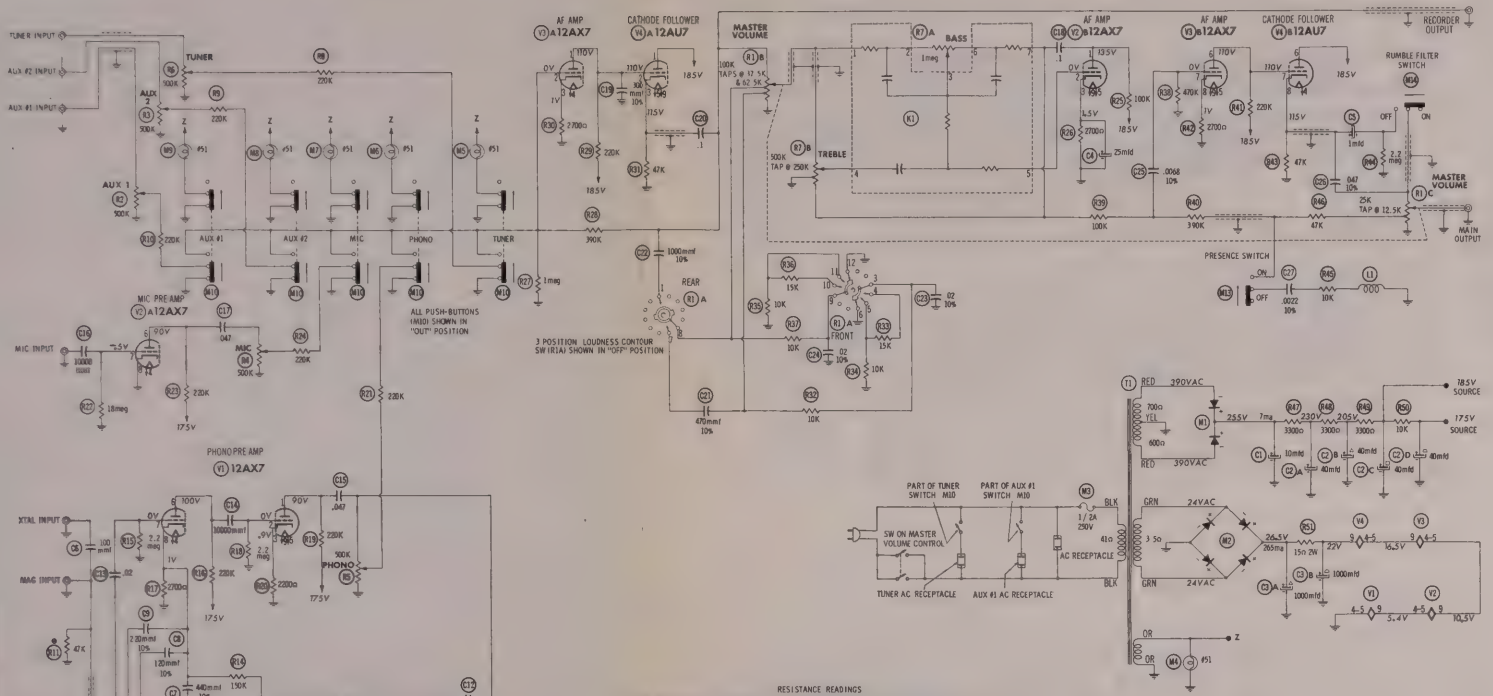
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	↑ 240K	2.2meg	2200Ω	0Ω	0Ω	↑ 240K	2.2meg	2700Ω	3.5Ω
V2	12AX7	↑ 110K	328K	2700Ω	3.5Ω	3.5Ω	↑ 240K	18meg	0Ω	5.5Ω
V3	12AX7	↑ 230K	308K	2700Ω	5.5Ω	5.5Ω	↑ 230K	470K	2700Ω	8Ω
V4	12AU7	↑ 10K	↑ 230K	47K	8Ω	8Ω	↑ 10K	↑ 230K	47K	10Ω

↑ MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

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GRANCO MODELS HF-1200, RP-1210, RP-1220, RP-1230

GRANCO MODELS HF-1200, RP-1210, RP-1220, RP-1230

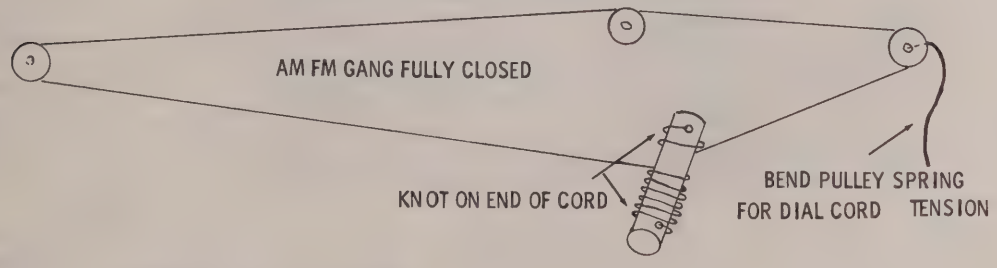
MODEL RP-1220

GRANCO MODELS HF-1200, RP-1210, RP-1220, RP-1230

TRADE NAME	Granco Models HF-1200, RP-1210, RP-1220, RP-1230		
MANUFACTURER	Granco Products, Inc., 36-07 20th Ave., Long Island City 5, N. Y.		
TYPE SET	AC Operated FM-AM Receiver With 4 Speed Automatic Record Changer		
TUBES	Twelve		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING	.84 Amp. @ 117 Volts AC (82 Watts) FM
TUNING RANGE - BROADCAST	535 - 1650KC	FREQ. MOD.	88 - 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M 1200A - PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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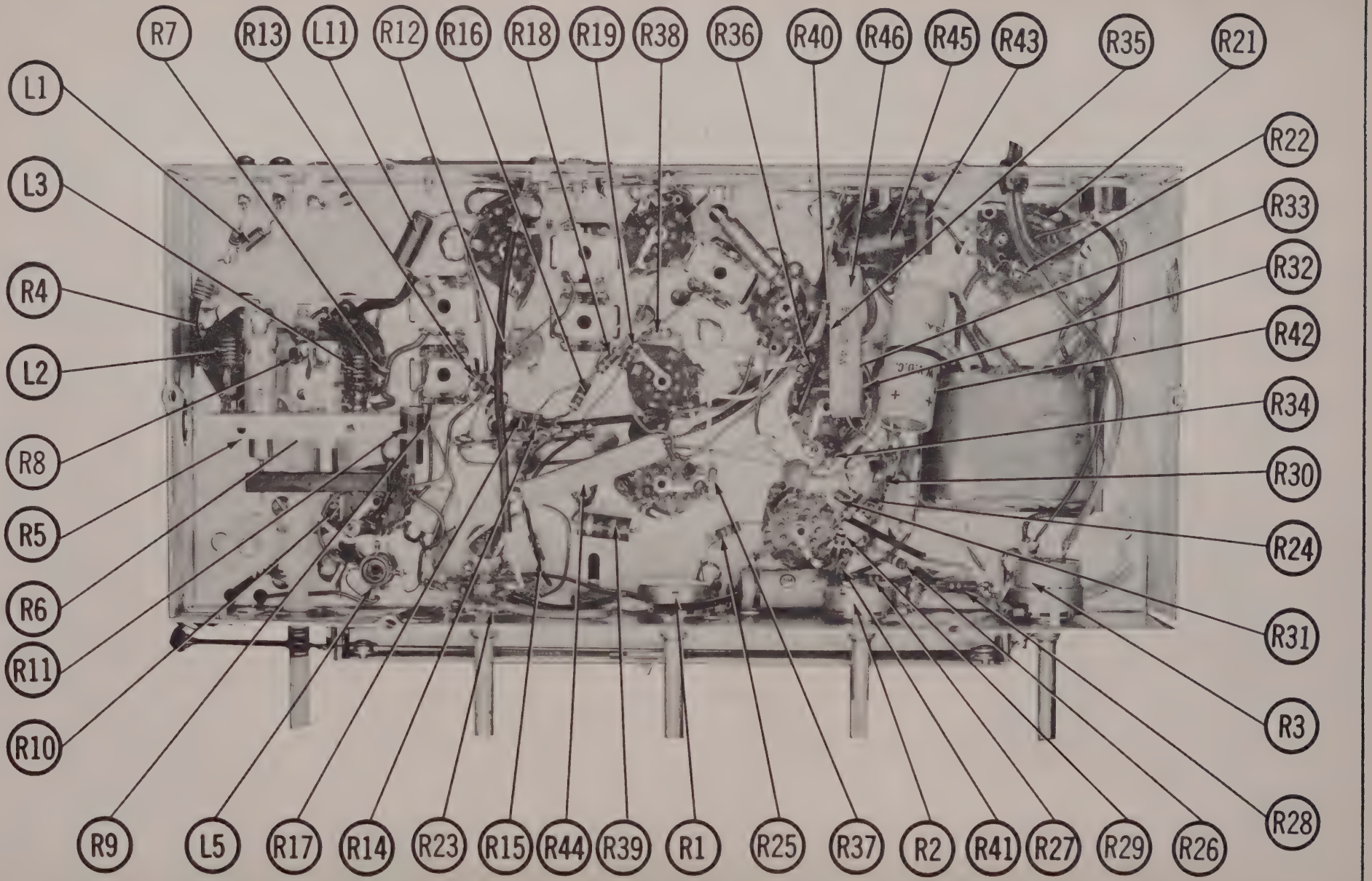
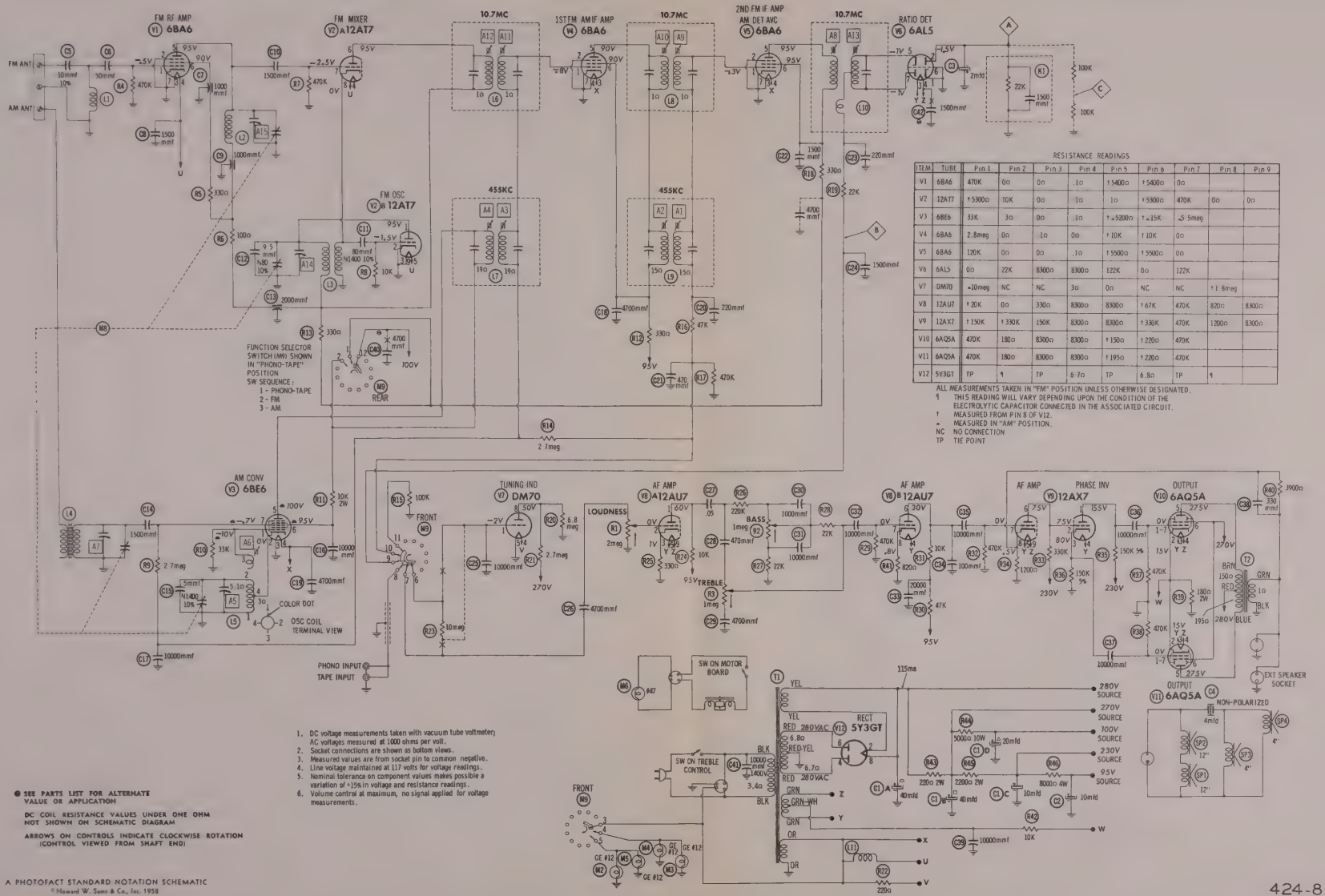


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BA6	470K	0Ω	0Ω	.1Ω	†5400Ω	†5400Ω	0Ω		
V2	12AT7	†5300Ω	10K	0Ω	1Ω	1Ω	†5300Ω	470K	0Ω	0Ω
V3	6BE6	33K	3Ω	0Ω	.1Ω	†▲5200Ω	†▲15K	.5 5meg		
V4	6BA6	2.8meg	0Ω	.1Ω	0Ω	†10K	†10K	0Ω		
V5	6BA6	120K	0Ω	0Ω	.1Ω	†5500Ω	†5500Ω	0Ω		
V6	6AL5	0Ω	22K	8300Ω	8300Ω	122K	0Ω	122K		
V7	DM70	▲10meg	NC	NC	3Ω	0Ω	NC	NC	†1 8meg	
V8	12AU7	†20K	0Ω	330Ω	8300Ω	8300Ω	†67K	470K	820Ω	8300Ω
V9	12AX7	†150K	†330K	150K	8300Ω	8300Ω	†330K	470K	1200Ω	8300Ω
V10	6AQ5A	470K	180Ω	8300Ω	8300Ω	†150Ω	†220Ω	470K		
V11	6AQ5A	470K	180Ω	8300Ω	8300Ω	†195Ω	†220Ω	470K		
V12	5Y3GT	TP	¶	TP	6.7Ω	TP	6.8Ω	TP	¶	

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 8 OF V12.
▲ MEASURED IN "AM" POSITION.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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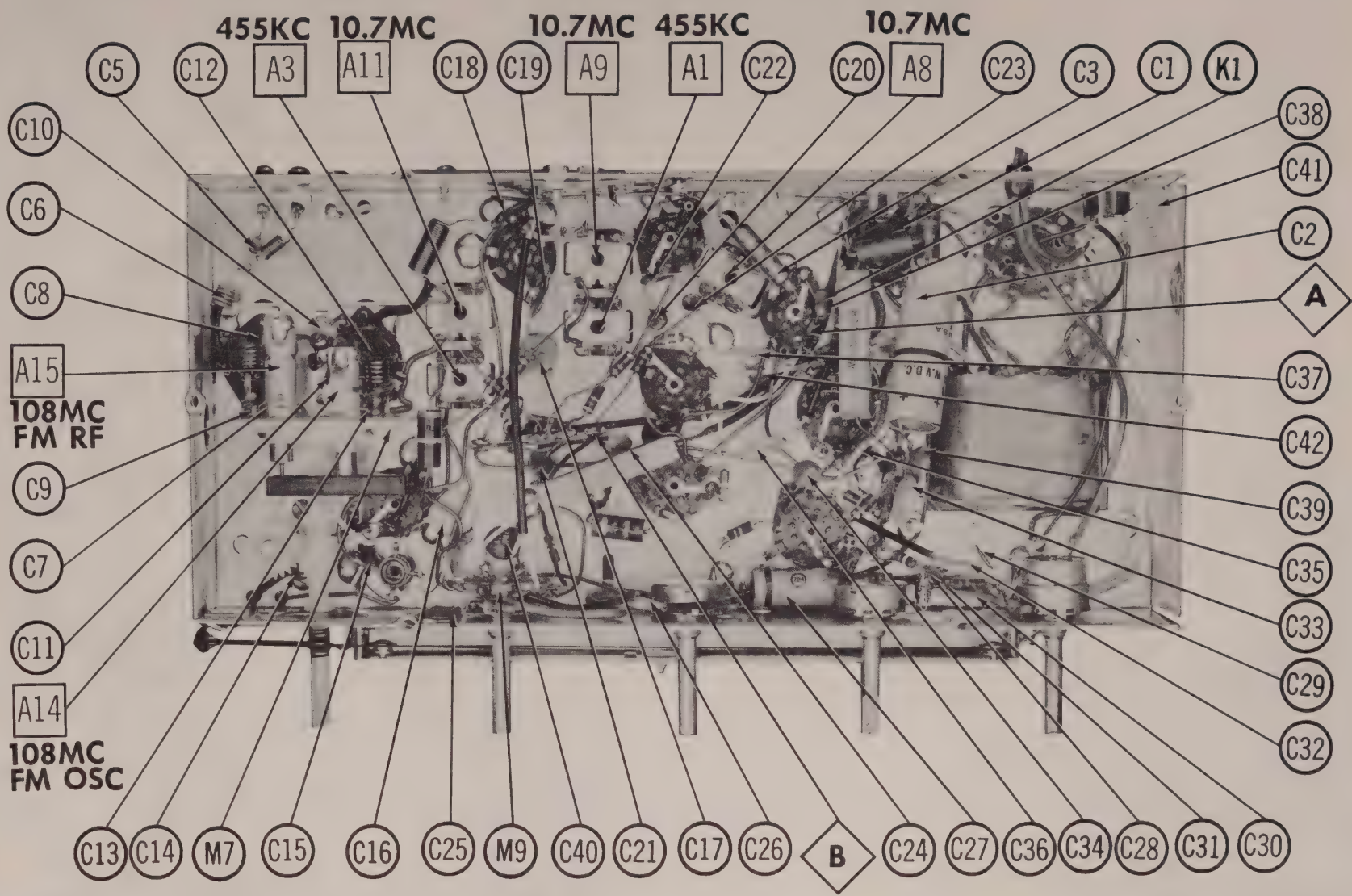


CHASSIS BOTTOM VIEW - CAPACITOR, MISC & ALIGN IDENT

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1600KC	"	1600KC	"	A5	"
3.	"	"	600KC	"	600KC	"	A6	Adjust for maximum output while rocking tuning gang. Repeat steps 2 and 3.
4.		Loop	1400KC	"	Tune to 1400KC signal	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	200mmf	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A8, A9, A10, A11, A12	Adjust for maximum deflection.
6.	"	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	200mmf	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (450KC swp)	FM	Point of non-interference	Vert. Amp. to point Ⓐ. Low side to chassis.	A8, A9, A10, A11, A12	Disconnect stabilizing capacitor C3. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
6.	"	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A13	Reconnect stabilizing capacitor C3. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	270Ω Carbon Resistor	Across FM antenna terminals	108MC (Unmod.)	FM	108MC	DC probe to point Ⓐ. Common to chassis.	A14, A15	Adjust for maximum deflection.
8.	"	"	88MC	"	88MC	"	L3, L2	Adjust for maximum deflection by compressing or expanding coil turns. Repeat steps 7 and 8.

FIG. 1

FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6BA6	
V2	FM Mixer-FM Osc.	12AT7	
V3	AM Converter	6BE6	
V4	1st FM-AM IF Amp.	6BA6	
V5	2nd FM IF Amplifier-AM Det. - AVC	6BA6	
V6	Ratio Detector	6AL5	

ITEM No.	USE	TYPE	NOTES
V7	Tuning Indicator	DM70	
V8	AF Amplifier	12AU7	
V9	AF Amp. - Phase Inv.	12AX7	
V10	Output	6AQ5A	
V11	Output	6AQ5A	
V12	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA GRANCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	350	46-2	AFH4-58-65	D0032	FP433.2	TMQ-18	Q-011.1	R2731 *
B	■40	350			BR2035	TC62	TD-30-350		
C	10	350							
D	▲20	350							
C2	10	300	41-8	PRS350V10	BR1045	TC62	TD-10-450	MT-4510	TVA-1604
C3	2	50		PRS50V2	BBR2-50	TT150X2	TD-2-50	MT-0502	TVA-1301
C4	4	50		PRS150V4	BBR4-50	TT50X4	TD-4-50	MT-0504	TVA-1402

* Not normally in distributors stock; available through distributor on order to manufacturer.

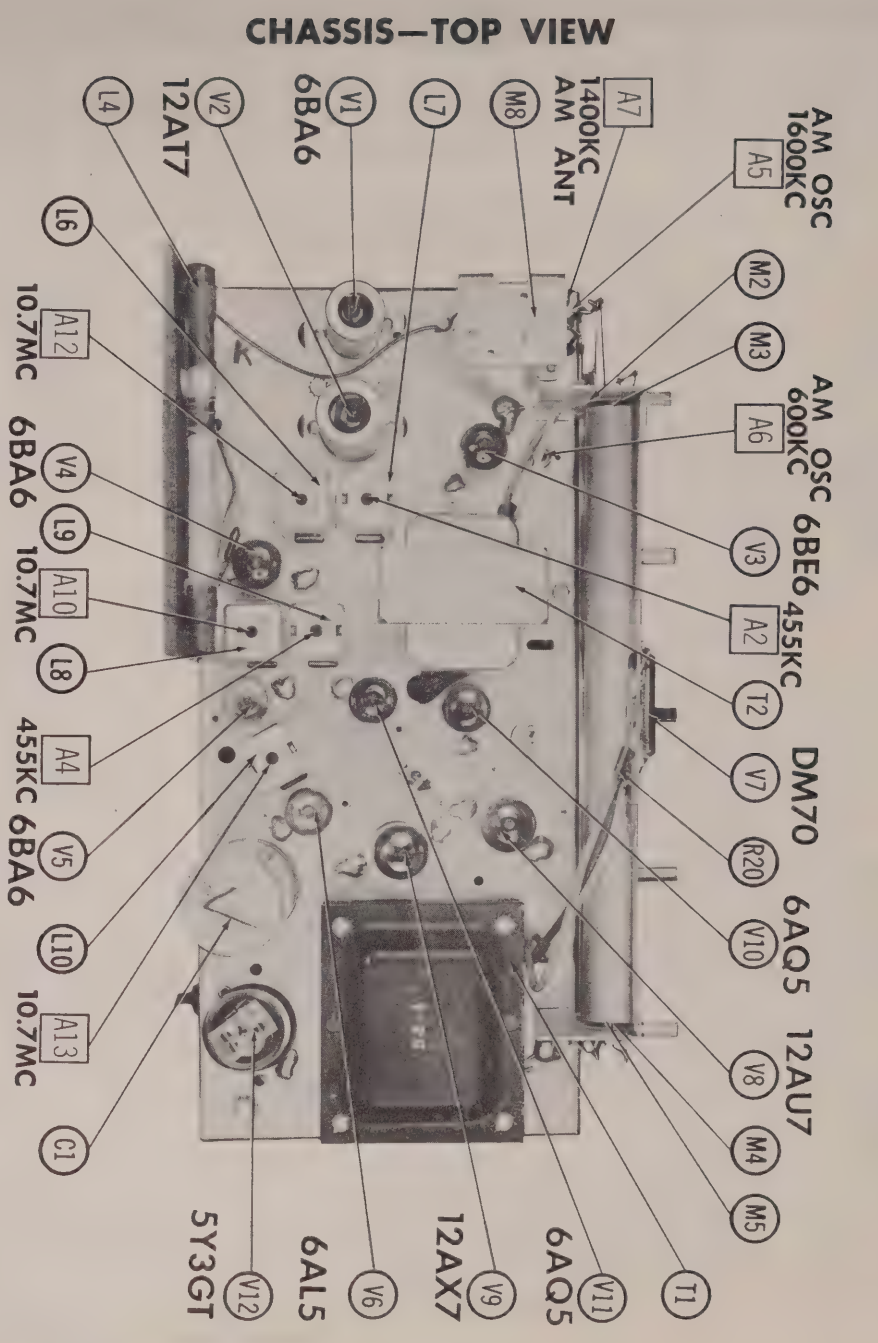
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA GRANCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	10			NPO-SI 10	TCZ-10	CTA6QIC	ZT-541	5TCC-Q1	10%
C6	50			SI 50	D6-500	LT6Q5	UC-545	5GA-Q5	
C7	1000			EF-001	MFT-1000			503C-D1	
C8	1500			BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15	
C9	1000			EF-001	MFT-1000			503C-D1	
C10	1500			BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15	
C11	80								N1400 10%
C12	9.5								N80 10%
C13	2000								
C14	1500			BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15	
C15	5								N1400 10%
C16	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-S1	
C17	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-S1	
C18	4700			BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C19	4700			BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C20	220			BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C21	470			BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C22	1500			BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15	
C23	220			BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C24	1500			BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15	
C25	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-S1	
C26	4700			BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	
C27	.05	400		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C28	470			BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C29	4700			BPD-0047	DD-472	BYA10D47	DC5247	5HK-D47	
C30	1000			BPD-001	DD-102	BYA6DI	DC521	5HK-D1	
C31	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-S1	
C32	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-S1	
C33	20000			BPD-02	DD-203	BYB6S2		5HK-S2	
C34	100			BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C35	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-S1	
C36	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-S1	
C37	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-S1	
C38	330			BPD-00033	DD-331	L10T33	UC-5333	5GA-T33	
C39	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-S1	
C40	4700			BPD-0047	DD-472	BYA10D47	UC-5247	5HK-D47	①
C41	10000	1400		DAC-27	DD16-103	HVE16S1		BL-S10	
C42	1500			BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15	①

① Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	GRANCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	45-13	B-76	A47-2meg-Z	Q13-139	U50	Loudness
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	1meg	½	45-12	B-70	A47-1meg-Z	Q13-137	U53	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1meg	½	45-11	B-697	A47-1meg-S	Q11-137	U54	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	Power On-Off

* Use KR with CRL "Red Label" controls and KB with "Blue Label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		GRANCO PART No.	NOTES
	OHMS	WATT		
R4	470K			
R5	330Ω			
R6	100Ω			
R7	470K			
R8	10K			
R9	2.7meg			
R10	33K			
R11	10K	2		
R12	330Ω			
R13	330Ω			
R14	2.7meg			
R15	100K			
R16	47K			
R17	470K			
R18	330Ω			
R19	22K			
R20	6.8meg			
R21	2.7meg			
R22	220Ω			
R23	10meg			
R24	10K			
R25	330Ω			

ITEM No.	RATING		GRANCO PART No.	NOTES
	OHMS	WATT		
R26	220K			
R27	22K			
R28	22K			
R29	470K			
R30	47K			
R31	10K			
R32	470K			
R33	330K			
R34	1200Ω			
R35	150K 5%			
R36	150K 5%			
R37	470K			
R38	470K			
R39	180Ω	2		
R40	3900Ω			
R41	820Ω			
R42	10K			
R43	220Ω	2		
R44	5000Ω	10(WW)		
R45	2200Ω	2		
R46	8000Ω	4(WW)		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		GRANCO PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Coil		19-1002	BC-563	4606		
L2	FM RF Coil						
L3	FM Osc. Coil						
L4	Loopstick	18-6					
L5	AM Osc. Coil	18-12-5		BC-393			
L6	1st FM IF	28-4	16-3487	FM-254	1463		
L7	1st AM IF	28-3	16-6764 *	BC-352	12-C1	RF-1	* Disregard Tap
L8	2nd FM IF	28-1	16-3487	FM-254	1463		
L9	2nd AM IF	BL-576	16-6764 *	BC-353	12-C2	RF-2	* Disregard Tap
L10	Ratio Detector	CL-473	17-3498	FM-255	1465		
L11	Fil. Choke		19-1002	BC-563	4606		2.1 Microhenries

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	GRANCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .84A	560VCT @ .115A	5V @ 2A	33-4						
	SEC. 3	SEC. 4	SEC. 5							
	6.3VCT @ 1.66A	6.3V @ 1.5A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	GRANCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9500Ω CT	6-8Ω	33-5A	Z1011	A-3027	AU-609	A-3870	26S59	S-55X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	GRANCO PART No.	QUAM PART No.	
SP1	12"	PM	3-4Ω	34-9	12A6A	
SP2	12"	PM	3-4Ω	34-9	12A6A	
SP3	4"	PM	3-4Ω	34-6	4A1TZ3.8	
SP4	4"	PM	3-4Ω	34-6	4A1TZ3.8	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	GRANCO PART No.	REPLACEMENT DATA
K1	Ratio Det. Network	1500mmf, 22K		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	GRANCO PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		81-T				

MISCELLANEOUS

ITEM No.	PART NAME	GRANCO PART No.	NOTES
M2	Lamp		G.E. #12
M3	Lamp		G.E. #12
M4	Lamp		G.E. #12
M5	Lamp		G.E. #12
M6	Lamp		#47
M7	Tuner	19-17	FM
M8	Tuning Cap.		4 Gang (AM Sections: Ant. 11-238mmf, Osc. 11-115mmf)
M9	Switch		AM-FM-Phono, 3 Position, Rotary, Wafer Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

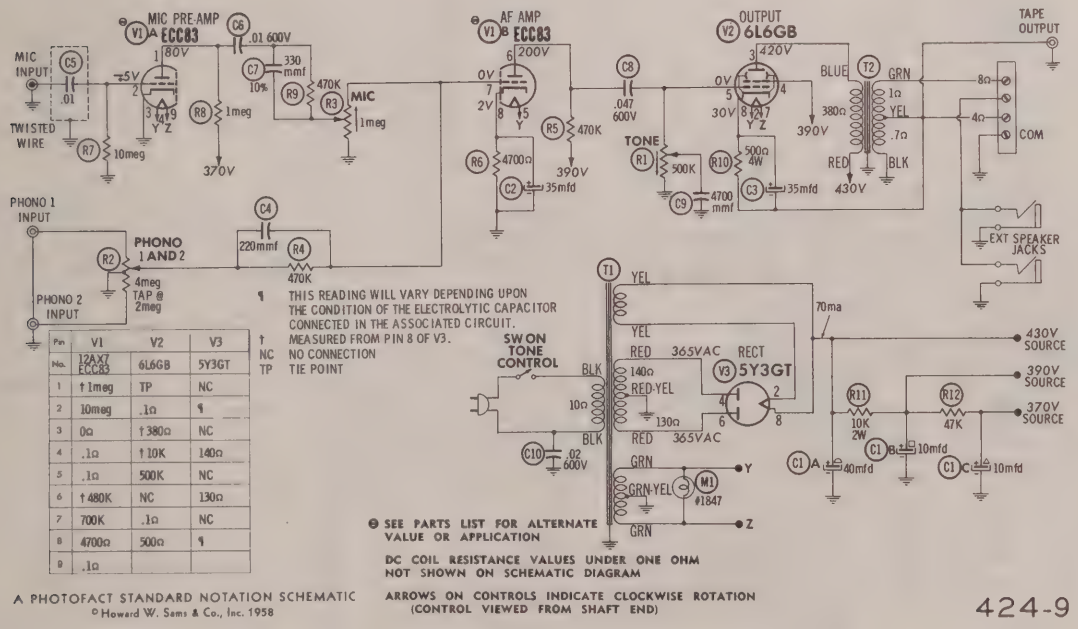
PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

KNIGHT MODEL KN-3008 (93SX504)

KNIGHT MODEL
KN-3008 (93SX504)

TRADE NAME	Knight Model KN-3008 (93SX504)
SUPPLIER	Allied Radio Corp., 100 N. Western Ave., Chicago 80, Illinois
TYPE SET	AC Operated 3 Channel 8 Watt Audio Amplifier
TUBES (Three)	Types 12AX7/ ECC83 (or) 12AD7 Mic. Preamp. -AF Amp., 6L6GB Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING .62 Amp. @ 117 Volts AC (62 Watts)



Pin No.	V1 12AX7 ECC83	V2 6L6GB	V3 5Y3GT
1	†1meg	TP	NC
2	10meg	.1Ω	¶
3	0Ω	†380Ω	NC
4	.1Ω	†10K	140Ω
5	.1Ω	500K	NC
6	†480K	NC	130Ω
7	700K	.1Ω	NC
8	4700Ω	500Ω	¶
9	.1Ω		

† MEASURED FROM PIN 8 OF V3.
NC NO CONNECTION
TP TIE POINT

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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424-9

KNIGHT MODEL
KN-3008 (93SX504)

SET 424 FOLDER 9

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Mic. Preamp. -AF Amp.	12AX7/ ECC83 ①
V2	Output	6L6GB

ITEM No.	USE	TYPE
V3	Rectifier	5Y3GT

①Alternate Type 12AD7.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	KNIGHT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	450		AFH3-41	C0320	FP396.2	TMT-36	Q-055	TVL-3783
B	■10	450							
C	▲10	450							
C2	35	50		PRS50V50	BR505	TC39	TD-50-50	MT-0550	TVA-1308
C3	35	50		PRS50V50	BR505	TC39	TD-50-50	MT-0550	TVA-1308

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	220			BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C5	.01	200		P288N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C6	.01	600		P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C7	330				MD-331	L10T33			10%
C8	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C9	4700			BPD-0047	DD-472	BYA10D47M	UC-5247	5HK-D47	
C10	.02	600		P688N-02	DD-203	CUB6S2	GEM-612	6TM-S2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	KNIGHT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	RP-504W-D	B-59	A47-500K-S	Q11-133	U50	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	
R2	4meg	½	RP-405-A					Phono 1 and 2, tap ⓐ 2meg
R3A	1meg	½	RP-105AD	B-70	A47-1meg-Z	Q13-137	U53	Microphone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

* Use KR on CRL "Red Label" controls and KB on "Blue Label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		KNIGHT PART No.	NOTES
	OHMS	WATT		
R4	470K			
R5	470K			
R6	4700Ω			
R7	10meg			
R8	1meg			

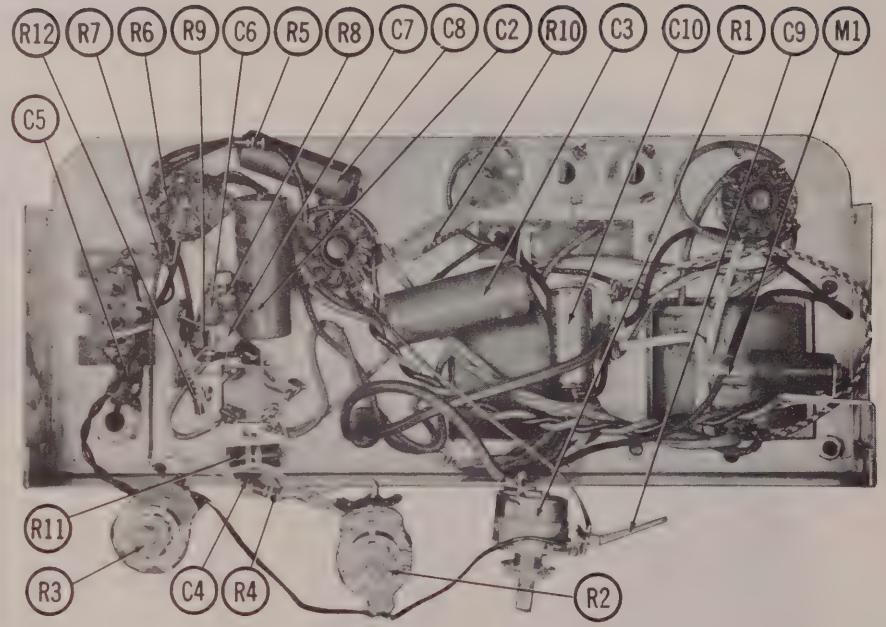
ITEM No.	RATING		KNIGHT PART No.	NOTES
	OHMS	WATT		
R9	470K			
R10	500Ω	4		
R11	10K	2		
R12	47K			

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ.62A	730VCT ⓐ.070A	5V ⓐ1.86A	LP-0257					22R31 ①	
	SEC. 3	SEC. 4	SEC. 5							
	6.3VCT ⓐ1.27A									

① Use original shields.

CHASSIS—BOTTOM VIEW



TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	KNIGHT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5600Ω	8Ω Tap ⓐ 4Ω	L0-0118C							

MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M1	Lamp		#1847

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT* Folder

MC INTOSH MODELS C-8 (Revised), C-8P (Revised), D-8A

MC INTOSH MODELS C-8 (Revised), C-8P (Revised), D-8A

MODEL C-8

MC INTOSH MODELS C-8 (Revised), C-8P (Revised), D-8A

TRADE NAME	Mc Intosh Models C-8, C-8P (Includes D-8A Power Supply) Serial #10600 and Higher
MANUFACTURER	Mc Intosh Laboratory, Inc., 2 Chambers Street, Binghamton, N. Y.
TYPE SET	Five Channel Audio Preamplifier
TUBES (Three)	Types 12AX7 Mic-Phono Preamplifier, 12AX7 Cathode Follower, 12AX7 AF Amp.-Cath. Follower
POWER SUPPLY	C-8: Externally Powered C-8P: 110-120 Volts AC-60 Cycles

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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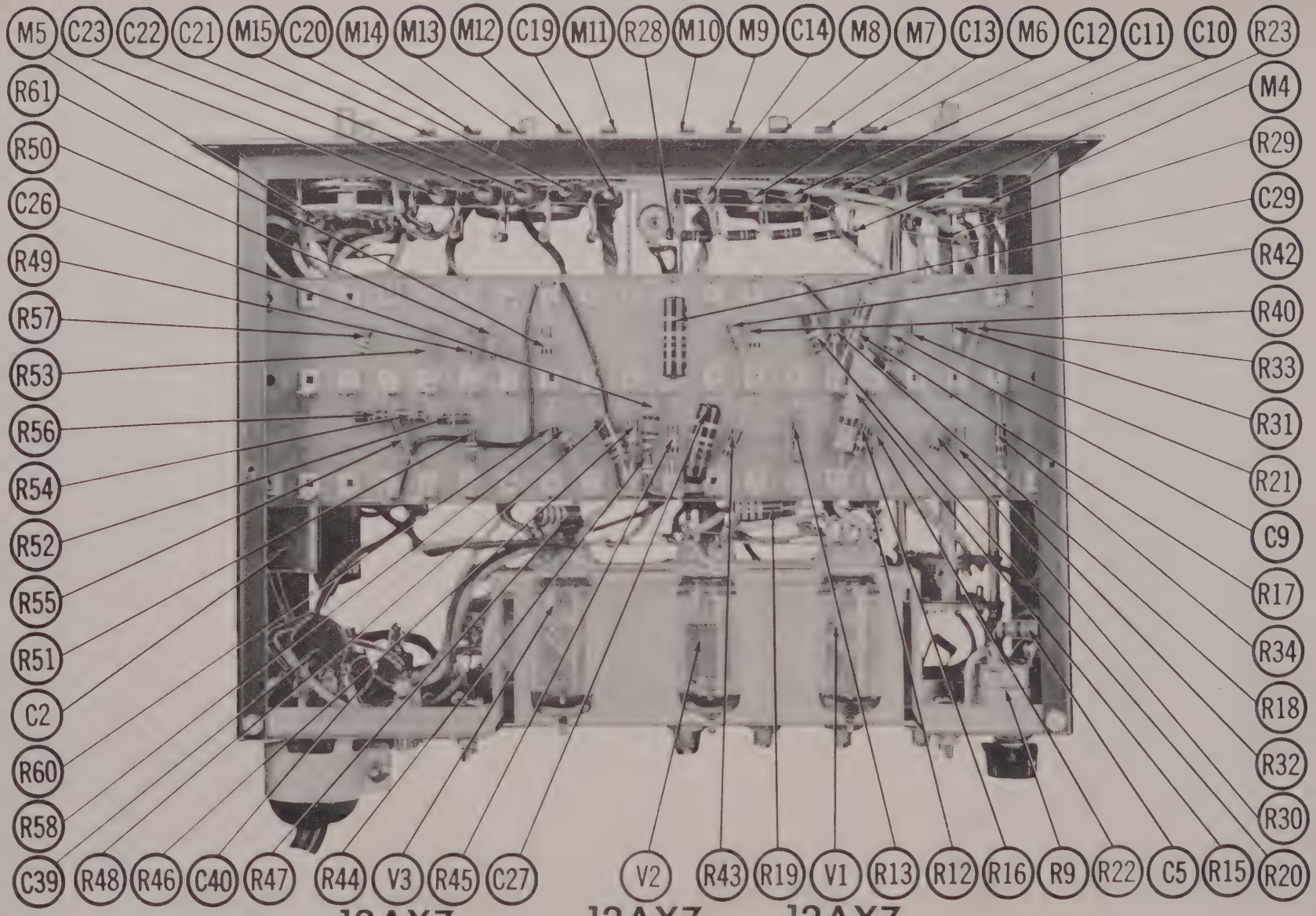
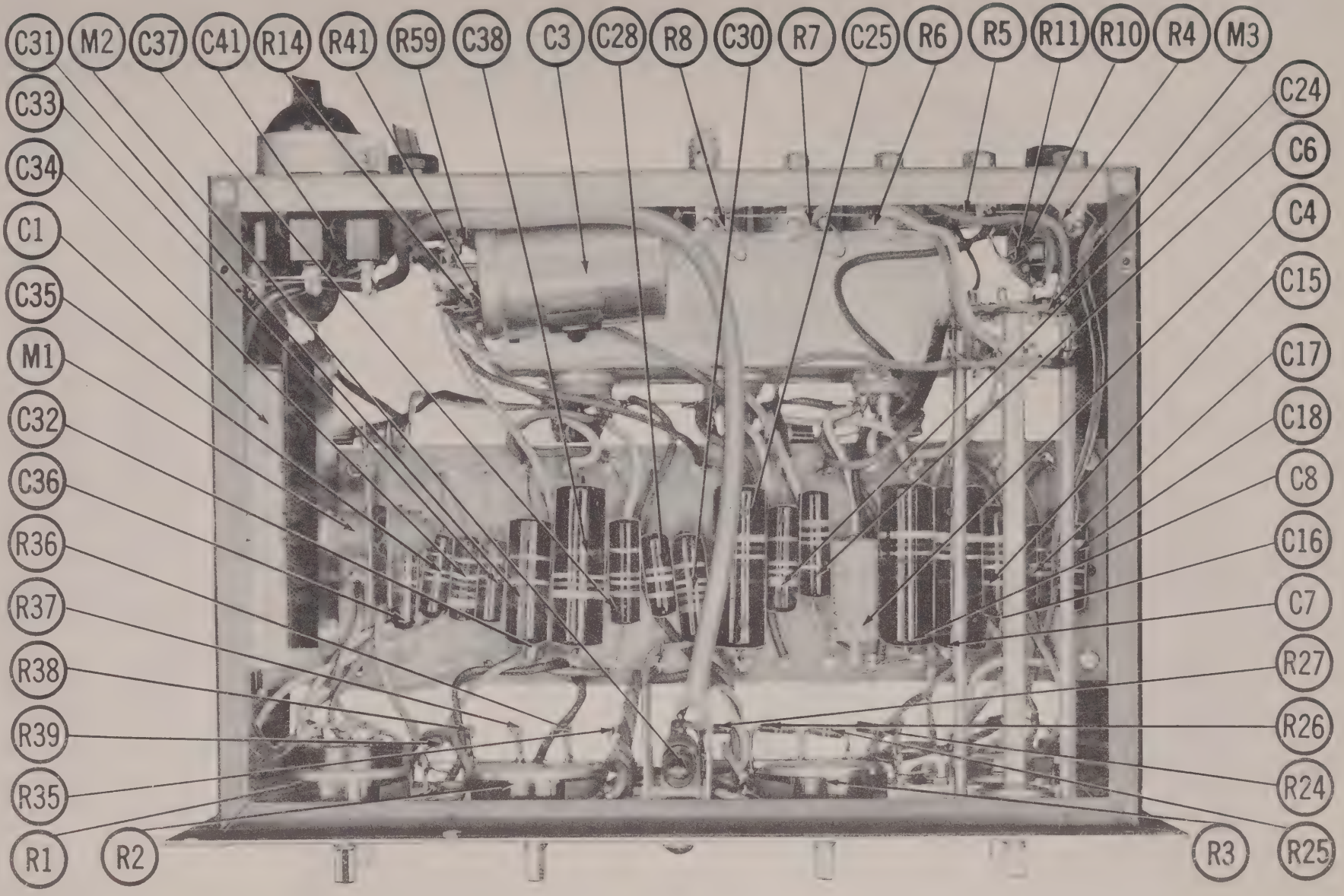


CHASSIS-TOP VIEW



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Phono-Mic Preamp.	12AX7	
V2	Cathode Follower	12AX7	
V3	AF Amp.-Cath. Follower	12AX7	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA McIntosh PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	2000	15		PRS15V2000	BR20001				R2425 *
C2	2000	15		PRS15V2000	BR20001				R2425 *
C3A	▲ 20	400		AFH3-36	B0430			T-635	R2317 *
B	■ 30	300			BR2045			MT-4510	
C	▲ 30	250							
C4	50	6		SRE6V50	BBR50-6	TT6X50	TD-50-6	MMT-650	TVA-1100

* Not normally in distributors stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA McIntosh PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	100			SI100	D6-101	LT6T1	UC-531	5GA-T1	
C6	.033	400		P488N-033	DF-303	CUB6S33	GEM-4133	4TM-S3	
C7	.47	200		P288N-47		CUB2P47	GEM-2047	2TM-P47	
C8	.47	200		P288N-47		CUB2P47	GEM-2047	2TM-P47	
C9	1500			SI1500	D6-152	LT6D15	UC-5215	5HK-D15	
C10	330			SI330	D6-331	LT6T33	UC-5333	5GA-T33	
C11	470			SI470	D6-471	LT6T47	UC-5347	5GA-T47	
C12	750			SI750	D6-751	LT6T75	UC-5375	5GA-T75	
C13	1000			SI1000	D6-102	LT6D1	UC-521	5HK-D1	
C14	1500			SI1500	D6-152	LT6D15	UC-5215	5HK-D15	
C15	.047	400							10%
C16	.022	400							10%
C17	.01	400					GEM-1611		10%
C18	.0047	400					GEM-16247		10%
C19	220			SI220	D6-221	LT6T22	UC-5322	5GA-T22	
C20	330			SI330	D6-331	LT6T33	UC-5333	5GA-T33	

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Mc Intosh PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C21	470			SI470	D6-471	LT6T47	UC-5347	5GA-T47	
C22	750			SI750	D6-751	LT6T75	UC-5375	5GA-T75	
C23	1000			SI1000	D6-102	LT6D1	UC-521	5GA-D1	
C24	.033	400		P488N-033	DF-303	CUB6S33	GEM-4133	4TM-S3	
C25	.47	200		P288N-47		CUB2P47	GEM-2047	2TM-P47	
C26	100			SI100	D6-101	LT6T1	UC-531	5GA-T1	
C27	.001	400					GEM-1621		10%
C28	.01	400					GEM-1611		10%
C29	.0022	400							10%
C30	.022	400							10%
C31	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C32	100			SI100	D6-101	LT6T1	UC-531	5GA-T1	
C33	.001	400					GEM-1621		10%
C34	.0047	400					GEM-16247		10%
C35	.01	400					GEM-1611		10%
C36	.01	400					GEM-1611		10%
C37	.033	400		P488N-033	DF-303	CUB6S33	GEM-4133	4TM-S3	
C38	.47	200		P288N-47		CUB2P47	GEM-2047	2TM-P47	
C39A	10000			BPD-2X01	DD3-103	BYD6DS1	DC511	5HK-2S1	
B	10000						DC511		
C40A	10000			BPD-2X01	DD3-103	BYD6DS1	DC511	5HK-2S1	
B	10000						DC511		
C41	4700			BPD-0047	DD-472	BYA10D47M		5HK-D47	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA McIntosh PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	1	2015125	B-69	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-20	76-2	US-27	Power On-Off
R2A	250K	1	1-010-2144	B-51	A47-250K-Z	Q13-130	U44	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	1meg	1	1-010-2145	B-70	A47-1meg-Z	Q13-137	U53	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4A	100K	½	DA1132	AB-40	A47-100K-S	Q11-128	U41	Phono 2 Load
B	Shaft			AK-9	RS-2	PQ	Not Req.	
C	Switch			KB-2 or KR-2*	SWE-20	76-2	US-27	Constant Amplitude Cartridge
R5A	100K	½	DA1131	AB-41	A47-100K-Z	Q13-128	U39	Level Phono 2
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS (cont)

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Mc Intosh PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R6A	100K	½	DA1131	AB-41	A47-100K-Z	Q13-128	U39	Level Phono 1
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	
R7A	100K	½	DA1131	AB-41	A47-100K-Z	Q13-128	U39	Level Mic
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	
R8A	500K	½	DL3458	AB-60	A47-500K-Z	Q13-133	U48	Level Tuner
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	
R9A	500K	½	DL3458	AB-60	A47-500K-Z	Q13-133	U48	Level Tape
B	Shaft			AK-1	FKS-1/4	RQ	Not Req.	

* Use KR with CRL "Red Label" controls and KB with "Blue Label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		McIntosh PART No.	NOTES
	OHMS	WATT		
R10	6800Ω			
R11	1000Ω 5%			
R12	1meg			
R13	220K			
R14	100K			
R15	1000Ω 5%	2		
R16	100K			
R17	3300Ω	1		
R18	1meg			
R19	330K	1		
R20	1800Ω	1		
R21	330K			
R22	22meg			
R23	22meg			
R24	22meg			
R25	22meg			
R26	22meg			
R27	22meg			
R28	22meg			
R29	3.3meg			
R30	1meg			
R31	220K			
R32	330K			
R33	680K			
R34	100K			
R35	10meg			

ITEM No.	RATING		McIntosh PART No.	NOTES
	OHMS	WATT		
R36	10meg			
R37	10meg			
R38	10meg			
R39	10meg			
R40	100K			
R41	100K			
R42	1800Ω			
R43	100K			
R44	220K			
R45	100K			
R46	10K			
R47	330K	1		
R48	1800Ω	1		Note 1.
R49	10meg			
R50	560K			
R51	560K			
R52	10meg			
R53	180K			
R54	10meg			
R55	68K			
R56	10meg			
R57	33K			
R58	1meg			
R59	12K	2		
R60	1800Ω			
R61	100K			

Note 1. Some versions may use 1200Ω 1W. in this application.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	McIntosh PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.42A		1017	C1B	4N26-1D1-ZS	

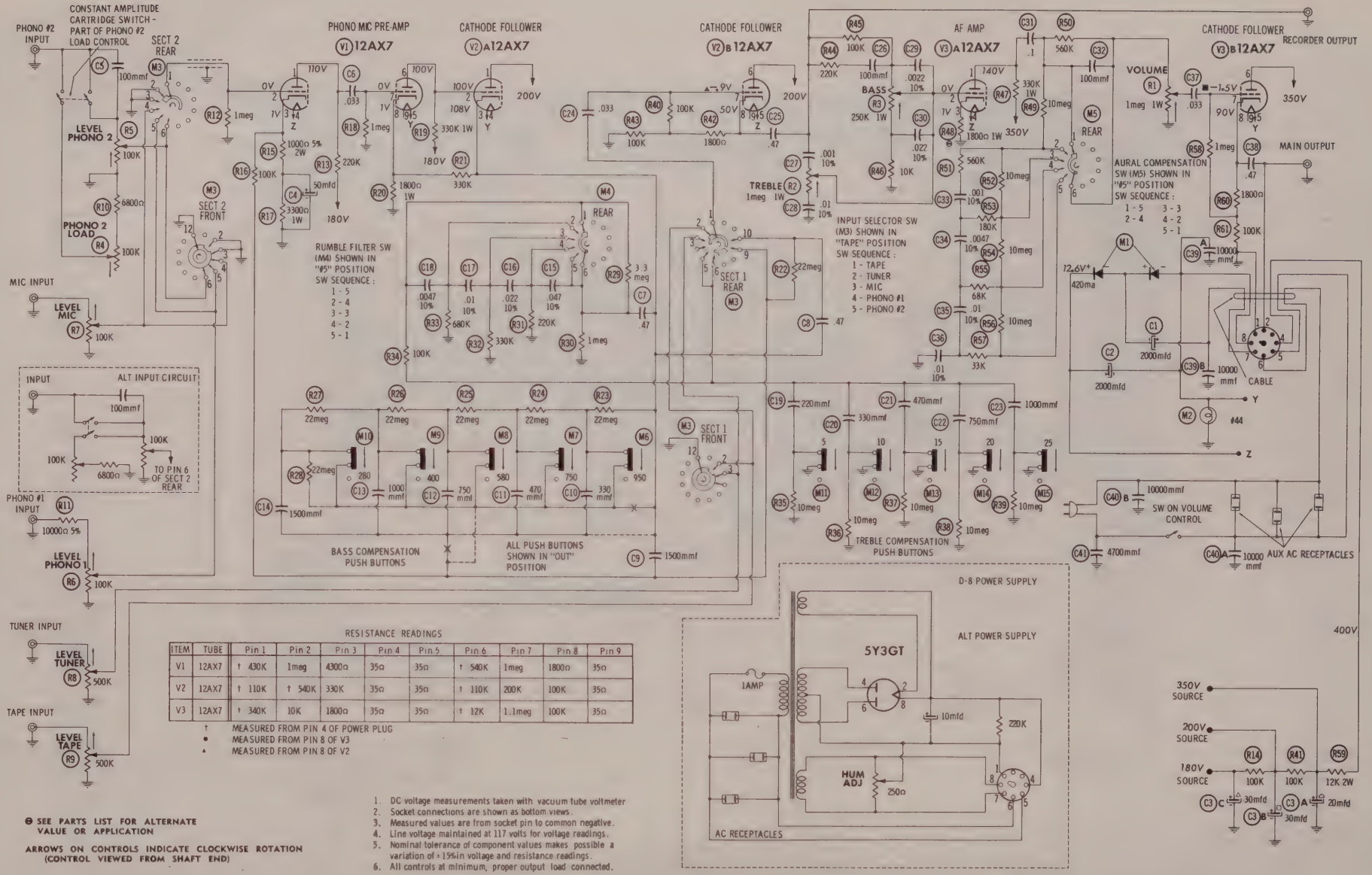
MISCELLANEOUS

ITEM No.	PART NAME	McIntosh PART No.	NOTES
M2	Lamp		#44
M3	Switch		Input Selevtor, Rotary, Wafer Type
M4	Switch		Rumble Filter, Rotary, Wafer Type
M5	Switch		Aural Compensation, Rotary, Wafer Type
M6	Switch		Record Compensator, 950, SPST, Slide Type
M7	Switch		Record Compensator, 750, SPST, Slide Type
M8	Switch		Record Compensator, 580, SPST, Slide Type
M9	Switch		Record Compensator, 400, SPST, Slide Type
M10	Switch		Record Compensator, 280, SPST, Slide Type
M11	Switch		Record Compensator, 5, SPST, Slide Type
M12	Switch		Record Compensator, 10, SPST, Slide Type
M13	Switch		Record Compensator, 15, SPST, Slide Type
M14	Switch		Record Compensator, 20, SPST, Slide Type
M15	Switch		Record Compensator, 25, SPST, Slide Type

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)


CONSTANT AMPLITUDE CARTRIDGE SWITCH - PART OF PHONO #2 LOAD CONTROL
PHONO #2 INPUT
SECT 2 REAR
PHONO MIC PRE-AMP V1 12AX7
CATHODE FOLLOWER V2A 12AX7
CATHODE FOLLOWER V2B 12AX7
AF AMP V3A 12AX7
CATHODE FOLLOWER V3B 12AX7
RECORDER OUTPUT
LEVEL PHONO 2
PHONO 2 LOAD
SECT 2 FRONT
RUMBLE FILTER SW (M4) SHOWN IN "#5" POSITION SW SEQUENCE : 1 - 5 2 - 4 3 - 3 4 - 2 5 - 1
INPUT SELECTOR SW (M3) SHOWN IN "TAPE" POSITION SW SEQUENCE : 1 - TAPE 2 - TUNER 3 - MIC 4 - PHONO #1 5 - PHONO #2
BASS
TREBLE
VOLUME
AURAL COMPENSATION SW (M5) SHOWN IN "#5" POSITION SW SEQUENCE : 1 - 5 2 - 4 3 - 3 4 - 2 5 - 1
MAIN OUTPUT
MIC INPUT
LEVEL MIC
INPUT
ALT INPUT CIRCUIT
TO PIN 6 OF SECT 2 REAR
PHONO #1 INPUT
LEVEL PHONO 1
TUNER INPUT
LEVEL TUNER
TAPE INPUT
LEVEL TAPE
SECT 1 REAR
SECT 1 FRONT
BASS COMPENSATION PUSH BUTTONS
ALL PUSH BUTTONS SHOWN IN "OUT" POSITION
TREBLE COMPENSATION PUSH BUTTONS
SW ON VOLUME CONTROL
AUX AC RECEPTACLES
CABLE
#44
D-8 POWER SUPPLY
ALT POWER SUPPLY
5Y3GT
1AMP
HUM ADJ
AC RECEPTACLES
350V SOURCE
200V SOURCE
180V SOURCE
400V

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	† 430K	1meg	4300Ω	35Ω	35Ω	† 540K	1meg	1800Ω	35Ω
V2	12AX7	† 110K	† 540K	330K	35Ω	35Ω	† 110K	200K	100K	35Ω
V3	12AX7	† 340K	10K	1800Ω	35Ω	35Ω	† 12K	1.1meg	100K	35Ω

† MEASURED FROM PIN 4 OF POWER PLUG
• MEASURED FROM PIN 8 OF V3
▲ MEASURED FROM PIN 8 OF V2

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

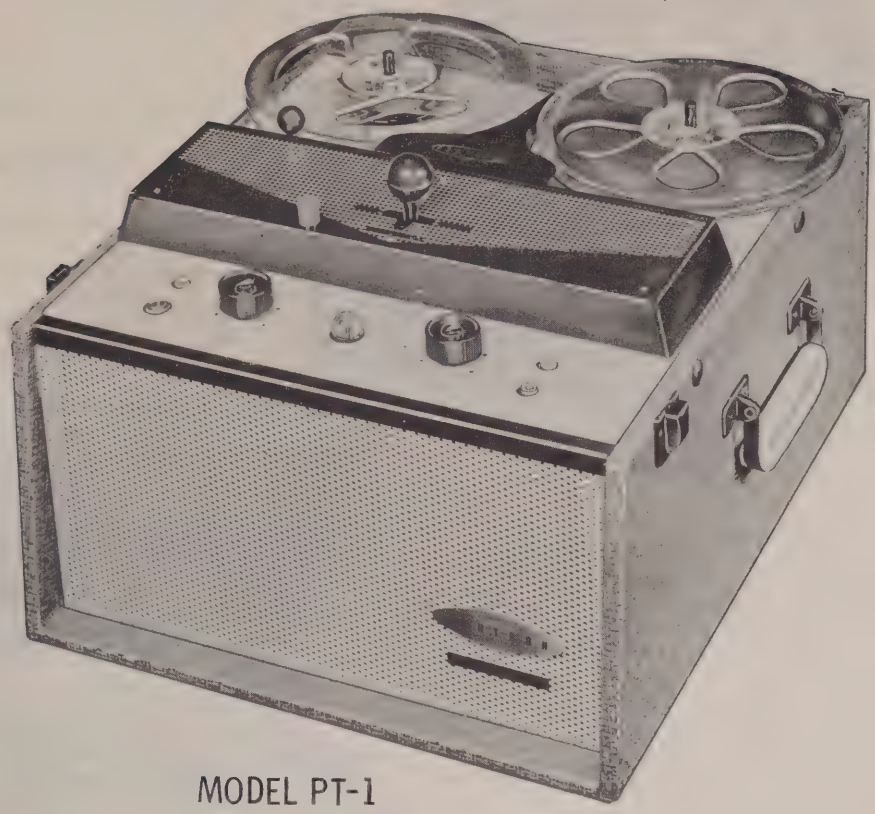
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PENTRON MODELS PT-1, S, PT-72, S, PT-74, S, PT-W3, S

PENTRON MODELS PT-1, S, PT-72, S, PT-74, S, PT-W3, S



MODEL PT-1

PENTRON MODELS PT-1, S, PT-72, S, PT-74, S, PT-W3, S

GENERAL INFORMATION

This service manual covers the Pentron Models PT-1, PT-1S, PT-72, PT-72S, PT-74, PT-74S, PT-W3, and PT-W3S. The transport mechanisms in these recorders are mechanically alike, except for a few minor variations. These tape recorder models bear the popular names of "Concerto", "Virtuoso", "Viceroy", and "Virtuoso Sr." in the same order as the foregoing model numbers.

Pentron Models PT-1, PT-1S, PT-72, PT-72S, PT-74, PT-74S, PT-W3, and PT-W3S make and play back tape recordings at either 3 3/4 or 7 1/2 inches per second. Recording is dual track; two full-length recordings can be made on a single reel of tape. Any size reel up to 7 inches can be used on these machines, giving a recording time of 3 hours or more, depending upon the tape thickness.

Models PT-1, PT-1S, PT-72, PT-72S, PT-74, PT-74S, PT-W3, and PT-W3S operate on a 60-cycle, 105 to 120-volt AC supply only. Before connecting, make certain your line supply agrees with the foregoing specification.

Manufactured by:

Pentron Corporation
777 South Trip Avenue
Chicago 24, Illinois

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS 6, INDIANA

C367

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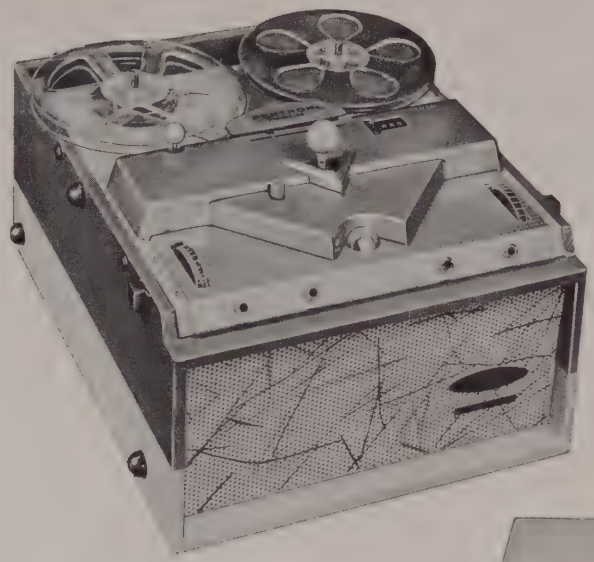
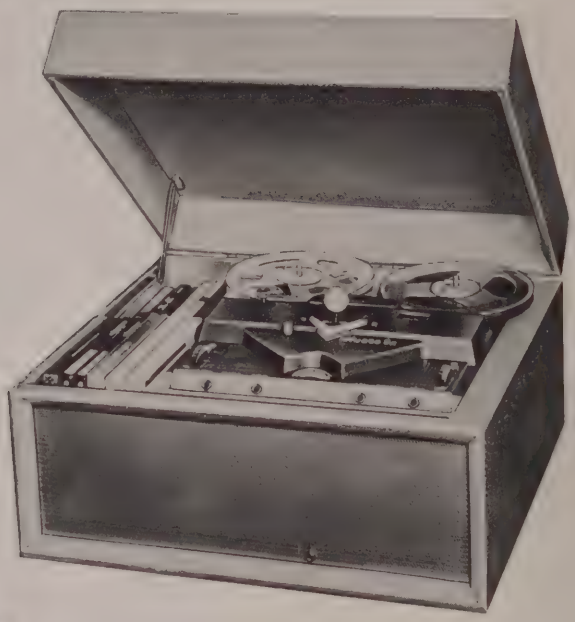
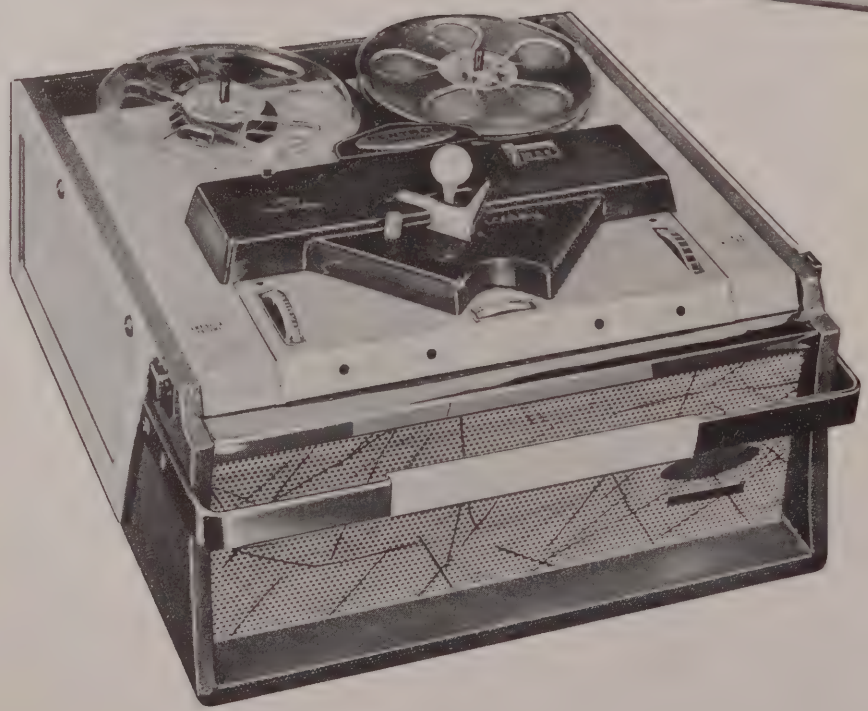


MODEL PT-72



MODEL PT-W3



MODEL PT-74

SPECIFICATIONS

Models designated with S have the stereo pre-amplifier, otherwise the units are identical to the corresponding models.

Models PT-1, PT-72, PT-74, and PT-W3

Speeds: 3 3/4 and 7 1/2 ips.

Fast Forward: Complete wind of a 7" reel in 75 seconds.

Rewind: Complete rewind of a 7" reel in 90 seconds.

Flutter: Under 0.4% at 7 1/2 ips.
Under 1% at 3 3/4 ips.

Motor: Heavy duty 4 pole, shaded pole, dynamically and individually balanced.

Frequency Response: 40 to 13,000 cps at 7 1/2 ips.
40 to 7,000 cps at 3 3/4 ips.

Power Output: (Model PT-1) 4 watts.
(Model PT-72) 5 watts.
(Models PT-74 and PT-W3) 10 watts push-pull.

Signal-to-Noise Ratio: (Model PT-1) 45 db.
(Model PT-72) 48 db.
(Models PT-74 & PT-W3) 50 db.

Record Level Indicator: (Model PT-1) Neon type.
(Model PT-2) Magic eye.
(Models PT-74 & PT-W3) Illuminated VU meter.

Input Jacks: One for microphone or magnetic phono cartridge; one for radio, TV, crystal or ceramic phono cartridge.

Output Jacks: One for external amplifier and headphone monitoring; one for external speaker.

Tube Complement: (Model PT-1) 6J7, 6SL7, 6V6, and 6X5.
(Model PT-72) 6J7, 6SL7, 6V6, 6E5, and 6X5.
(Model PT-74) 6J7, 6SL7, 12AU7, 6V6, two 6AQ5's, and 6X5.
(Model PT-W3) 6J7, 7SL7, 12AU7, 6V6, two 6AQ5's, and 6X5.

Power Consumption: (Model PT-1) 70 watts full load.
(Models PT-72 & PT-W3) 80 watts full load.
(Model PT-74), 110 watts full load.

FUNCTIONS OF CONTROLS, INDICATORS, AND SWITCHES

Speed Control

Tape speed in controlled by moving speed change knob (5) up or down. When knob is in up position, the tape speed is 3 3/4 ips. When knob is in down position, the tape speed is 7 1/2 ips. Change speeds only with the "Unimagic" control in the neutral position.

The mechanical action during a speed-change operation is as follows: As speed change knob (5) is moved up or down, attached shaft (63 or 66) is moved up or down accordingly. Idler wheel (91) and idler bracket subassembly (92) are attached to the shaft assembly and move up or down with it, thus allowing idler wheel (91) to contact one of the two steps on motor pulley(96). When speed change knob (5) is in the up position, idler wheel (91) is also in the up position and contacts the smaller step on motor pulley (96). A tape speed of 3 3/4 ips results. When speed change knob (5) is in the down position, idler wheel (91) is also in the down position and contacts the larger step of motor pulley (96). This results in a tape speed of 7 1/2 ips.

When speed change knob (5) is set for a tape speed of 7 1/2 ips, the downward movement of speed change shaft (66) opens speed equalization switch (M3 on Model PT-72 and M7 on Models PT-74 and PT-W3) to obtain correct equalization for the 7 1/2 ips tape speed.

"Unimagic" Control

This control has three positions:
A — Play-Record (P-R)
B — Rewind (R)
C — Wind (W) — Fast Forward

A — Play-Record (P-R)

When "Unimagic" control (6) is moved into P-R position, play-record control cam (39) is actuated by the shaft in the control. This pivoting movement of cam (39) allows slide plate (40) to be activated by pressure roller spring (53). This engages pressure roller (23) with the capstan, which in turn drives the tape at a constant speed. Take-up adjusting lever (56), held against the end of slide plate (40) by take-up pressure spring (52), is pivoted as the slide plate moves forward. This causes take-up adjusting lever (49) to press against equalizer bar (85) with just enough pressure for take-up belt (94) to become taut and to rotate take-up pulley (95) so as to wind tape on the reel. This acts as a clutch by allowing the belt to slip, due to the slower speed of the capstan. Also, by the movement of slide plate (40), pressure is removed from pressure arm lever (41), which has been engaged with the pressure pad pivot pin on pressure finger carrier (34) holding the pressure pads away from the heads. When pressure is removed from pressure arm lever (41), pressure finger spring (43) pulls pressure finger carrier (34) inward, causing

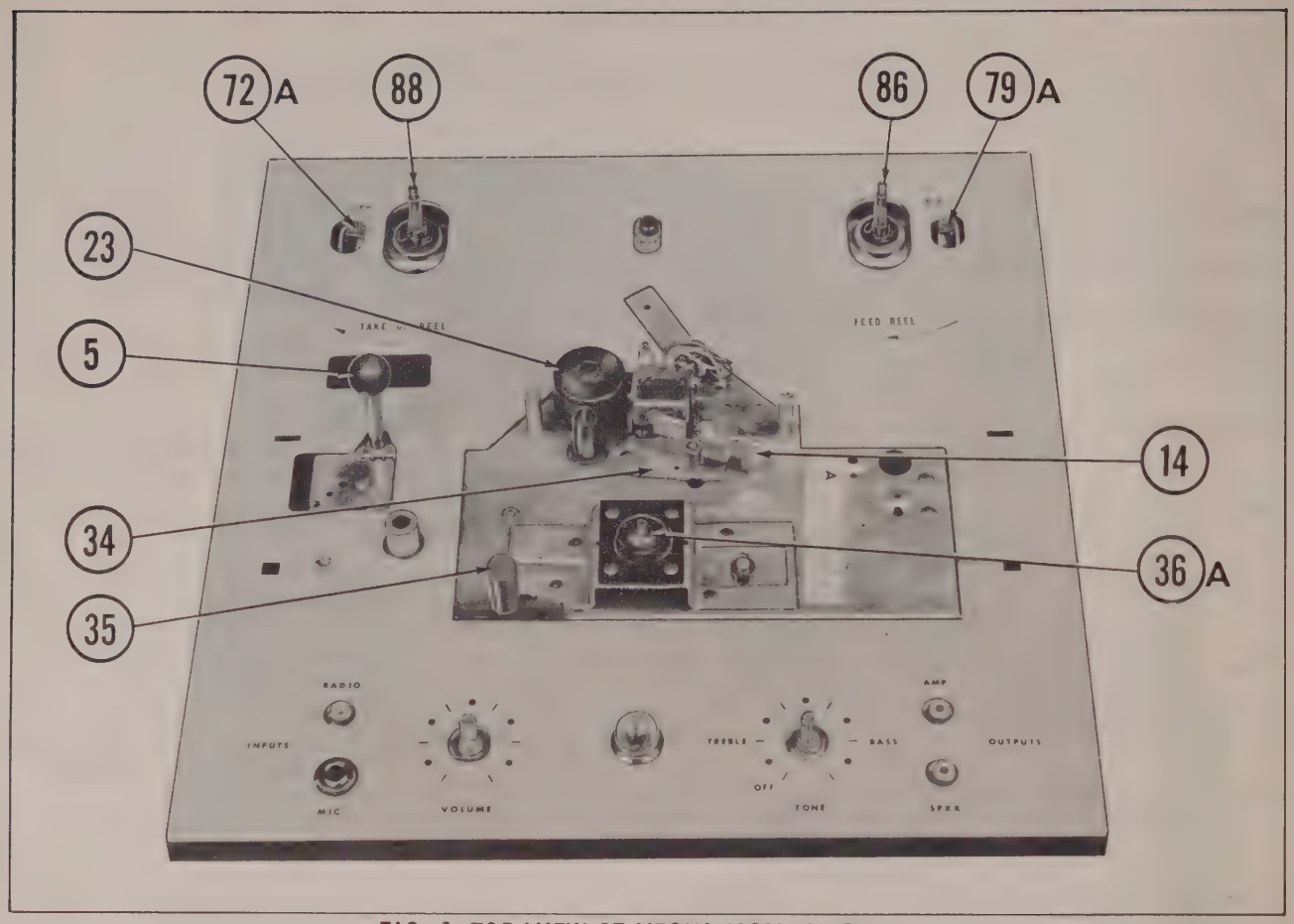


FIG. 1 TOP VIEW OF MECHANISM-MODEL PT-1

pressure pads (14) to bear against the tape and hold it in positive contact with the heads.

B — Rewind (R)

When "Unimagic" control (6) is pivoted to the R position, wind-rewind slide plate (44) is activated by the shaft under the "Unimagic" control. Wind-rewind slide plate (44) in turn pushes on tie bar (60) which bears against equalizer bar (85) via an elastic stop nut (76) and spring (77), causing equalizer bar (85) to pivot counterclockwise. Pivoting of the equalizer bar makes feed belt (81) taut, in turn driving the rewind pulley (98) at high speed.

C — Wind (W) — FAST FORWARD

When the "Unimagic" control (6) is pivoted to the W position, wind-rewind slide plate (44) is activated by the shaft under the "Unimagic" control. Wind-rewind slide plate (44) in turn pulls on tie bar (60) which bears against equalizer bar (85) via elastic stop nut (76) and spring (77), causing equalizer bar (85) to pivot clockwise. Pivoting of equalizer bar (85) makes take-up belt (94) taut, in turn, driving take-up pulley (95) at high speed.

Brakes

When "Unimagic" control (6) is in neutral position (upright), the shaft under the "Unimagic" control pushed against control spring plate (61). The control spring plate then activates brake arms (72) and (79) via brake adjustment screws (74) and (74A). Activation of the brake arms causes them to pivot, thus putting the brake linings in contact with the underside of reel rests (2). The brake linings can be seen by removing spindle caps (1) and reel rests (2). When the "Unimagic" control is placed in either play, wind, or rewind position, control spring plate (61) is released, thus deactivating the brakes. When the "Unimagic" control is returned to neutral from the rewind position, control spring plate (61) is pivoted counterclockwise, thus activating the left brake arm before the right brake arm to avoid tape spillage. When returning the "Unimagic" control to neutral from fast forward position, the control spring plate is pivoted clockwise, thus activating the right brake arm before the left brake arm to avoid tape spillage.

Volume Control (Model PT-1)

Turning the VOLUME control clockwise increases the volume level for both recording and playback.

Volume Control (Models PT-72, PT-74, and PT-W3)

Turning the VOLUME control forward (toward the operator) increases the volume level for both recording and playback. The first few degrees of rotation operate the AMP OFF switch.

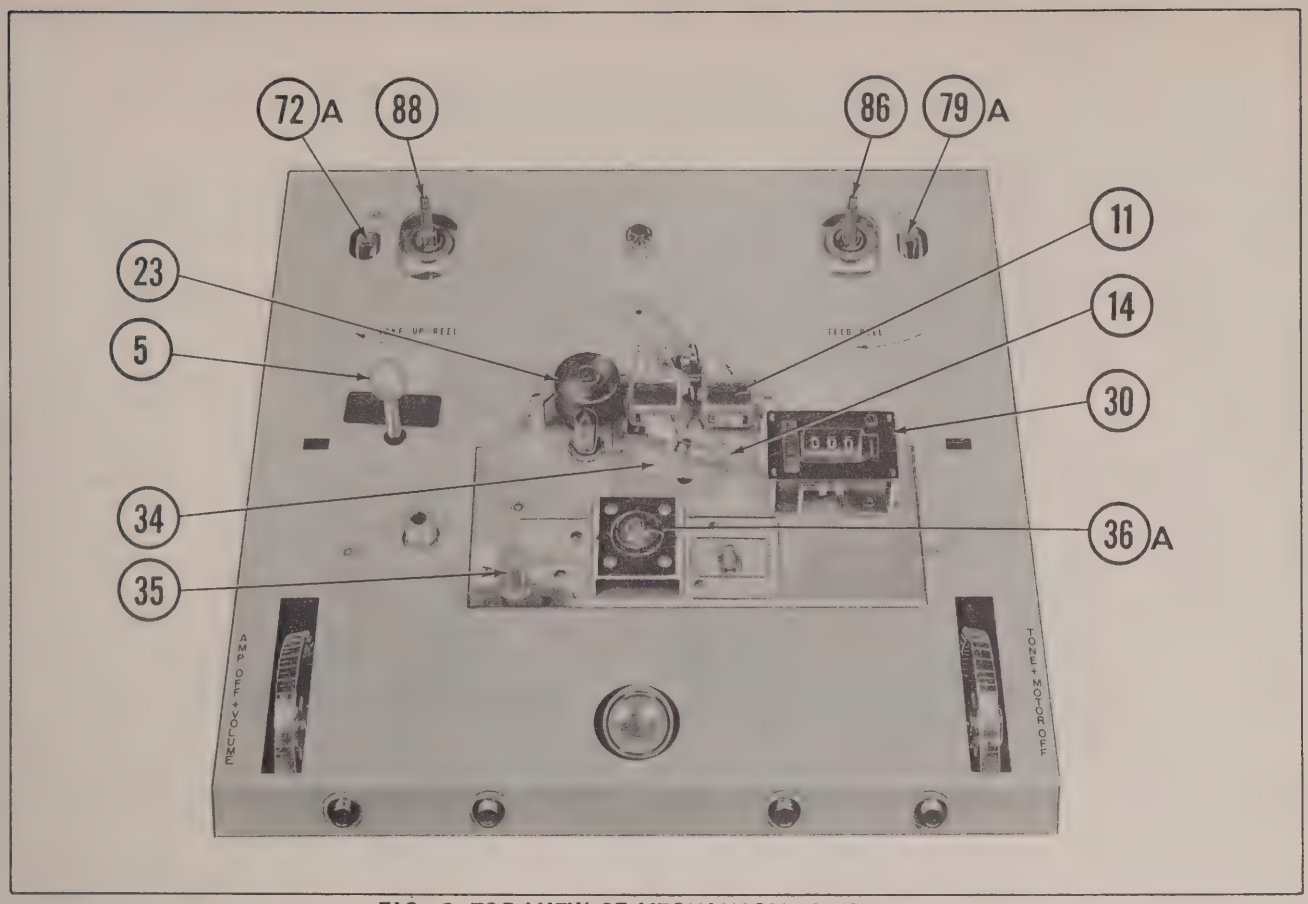


FIG. 2 TOP VIEW OF MECHANISM - MODEL PT-72

Tone Control (Model PT-1)

The TONE control varies the relative strength of the bass and treble frequencies during playback. Turning the control clockwise increases the bass and reduces the treble. This control has no effect on the tone during recording. The first few degrees of rotation operate the OFF switch controlling both the motor and amplifier.

Tone Control (Models PT-72, PT-74, and PT-W3)

Turning the control toward rear of unit away from operator) increases the treble and reduces the bass. This control has no effect on the tone during recording. The first few degrees of rotation operate the MOTOR OFF switch.

Record Lock Button

Depressing record lock button (35) switches the recording circuits into operation. If the "Unimagic" control is then pivoted to the P-R position, the record lock button is held in recording position until the "Unimagic" control is returned to neutral. This automatically releases record lock button (35).

Automatic Shut-off Switch (Models PT-74 and PT-W3 (Early Versions)

Automatic shut-off switch (17 and 19) is located between the erase and play-record head. When tape is placed in the loading slot, it falls between the two contacts of this switch. Thus, the switch contacts are kept from closing as long as tape is being transported past the heads. When the end of a reel of tape is reached or if the tape breaks, the contact close, shutting off the mechanism.

The electrical action of the automatic shutoff feature is as follows:

The switch contacts of relay (M5) are in series with the motor circuit and are held closed by current through (M5). The automatic shutoff switch is in parallel with the windings of relay (M5) so that when the shut-off switch closes at the end of a reel, it shorts across the relay windings and the relay switch opens, breaking the drive motor circuit.

Automatic Shut-off Switch (Models PT-74 and PT-W3 (Late Versions)

The automatic shut-off switch is located to the left of the erase and playback head assembly on Models PT-74 and PT-W3. When tape is properly threaded, it falls between the plastic finger and metal post of this switch. Thus, when the end of a reel of tape is reached, or if the tape breaks, the plastic finger moves toward the metal post, opening the switch contacts and breaking the motor circuit.

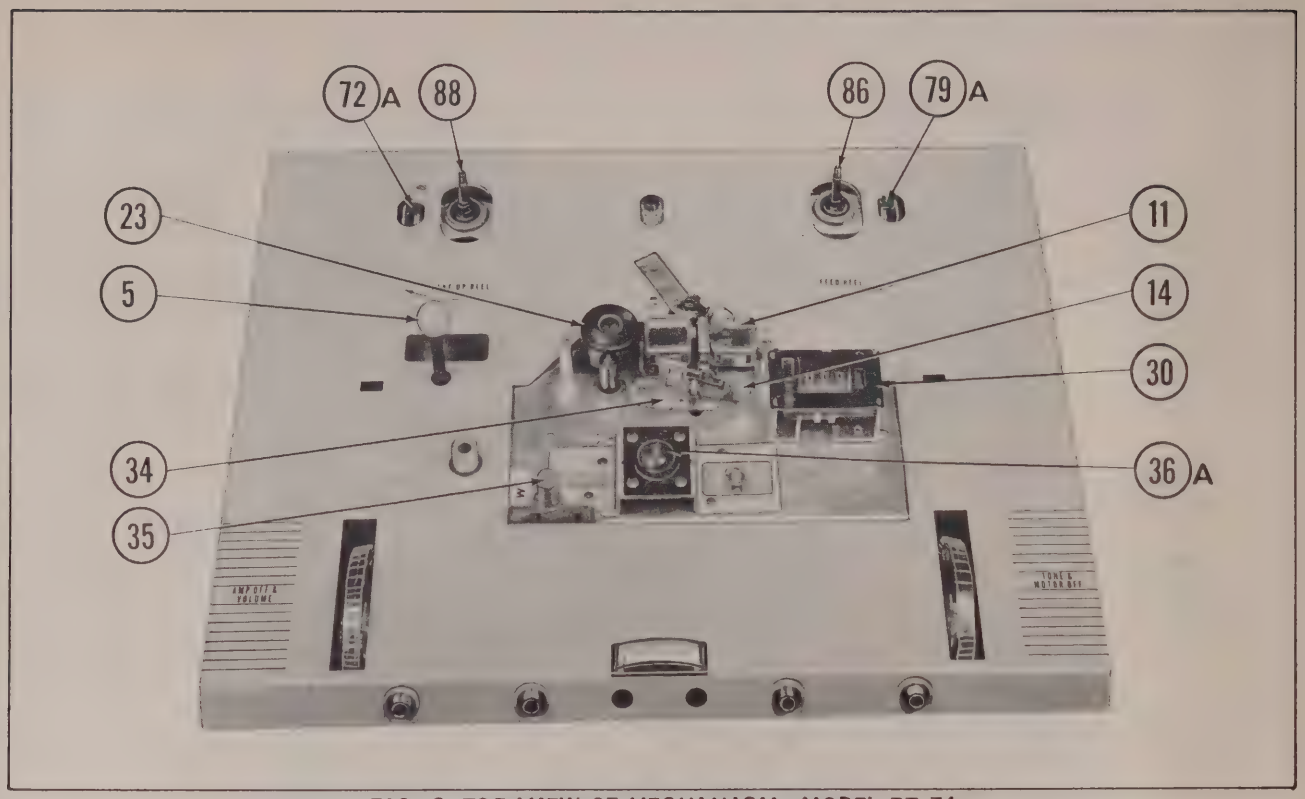


FIG. 3 TOP VIEW OF MECHANISM - MODEL PT-74

OPERATING INSTRUCTIONS

Tape Loading and Threading

1. Place a reel of tape on the right-hand (FEED REEL) spindle so the reel turns clockwise when tape is pulled from the reel. Use "A" wind tape — that is, tape that is wound coated side inwards. "B" wind tape can be easily changed to "A" wind by giving the tape a half twist before threading and running the tape through fast forward or rewind operation.

2. Place an empty reel on the left-hand (TAKE-UP) spindle. Make sure both reels are properly seated on the reel rests.

3. Reel out a convenient length of tape and hold a section straight with both hands. Drop this section into the tape slot and thread the free end into one of the slots in the hub of the TAKE-UP REEL. Turn the reel by hand until several turns have secured the tape to the reel and all slack between reels has been taken up.

To Record from Microphone

1. Insert microphone plug into MIC jack.

2. Set the record level. This can be done before tape movement is started by holding down record lock button (35) while adjusting the VOLUME control for proper response from the indicator. The proper volume levels are as follows:

(a) Model PT-1 (Neon Bulb) — Adjust the volume level so the loudest portions of the signal just cause the lamp to flash.

(b) Model PT-72 (Magic Eye) — Adjust the volume level so the loudest portions of the signal just cause the eye to close.

(c) Models PT-74 and PT-W3(VU meter) – Adjust the volume level so the meter deflection peaks do not go past zero, or into the red area of dial calibration.

3. Hold down the record lock button (35) and pivot the "Unimagic" control forward (toward the operator), thus starting the recorder. When through recording, return the "Unimagic" control to neutral (upright). The record lock button will automatically release and deactivate the record circuits.

To Record from Radio, TV or Phonograph

1. Connect the output signal from the radio, TV, or phonograph to the RADIO input jack of the recorder.

2. Proceed as described under "To Record from Microphone", Steps 2 and 3.

To Play a Recording

1. Pivot "Unimagic" control forward (toward the operator).

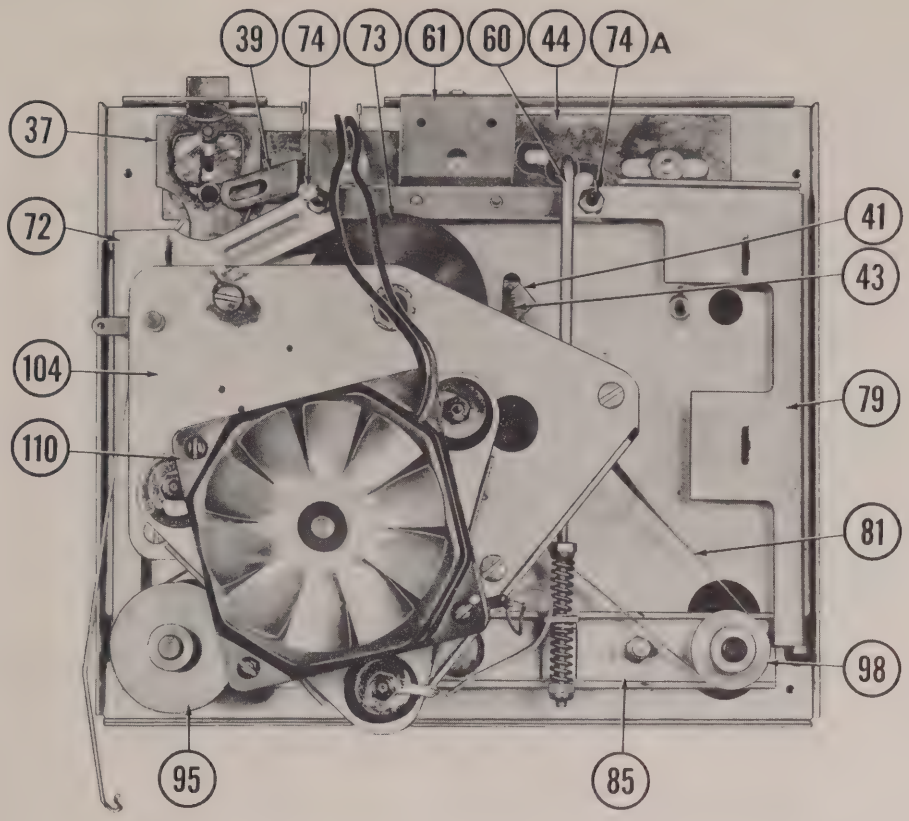


FIG. 4 BOTTOM VIEW OF MECHANISM-MODEL PT-1

2. Adjust the VOLUME and TONE controls for desired listening quality.

Dual-Track Recording

With these recorders, only one-half the tape width is recorded at a time, thereby resulting in dual-track recording. To make a dual-track recording, proceed as follows:

1. After a reel of tape has been recorded, i. e., all the tape wound onto the TAKE-UP REEL, place the "Unimagic" control in neutral position.

2. Remove the reels from the recorder, turn the full reel over and place it on the FEED REEL spindle. Place the empty reel on the TAKE-UP REEL spindle.

3. Thread tape and proceed with the recording.

4. After the second track has been recorded, the first track can be played without rewinding by trading reels on the spindles as in Step 2, rethreading the tape and placing the recorder in play operation.

To Erase Recordings

These recorders automatically erase previous recordings as new recordings are being made. To erase without recording new material, set all controls as if recording but do not plug in the microphone or other program source, and run the tape through the machine.

To Use an External Amplifier

Connect the recorder jack marked AMP to the external amplifier input. This input should be able to accept a high level signal requiring no further equalization for flat playback response.

To Use an External Speaker

Plug the external speaker into the jack marked SPKR. On Models PT-72, PT-74, and PT-W3, this automatically disconnects the internal speakers. On Model PT-1, plugging in an external speaker places it in parallel with the internal speaker.

To Use as a P.A. System

Any of the Model PT-1, PT-72, PT-74, or PT-W3 recorders can be used as a public address system by plugging the microphone into the RADIO input jack.

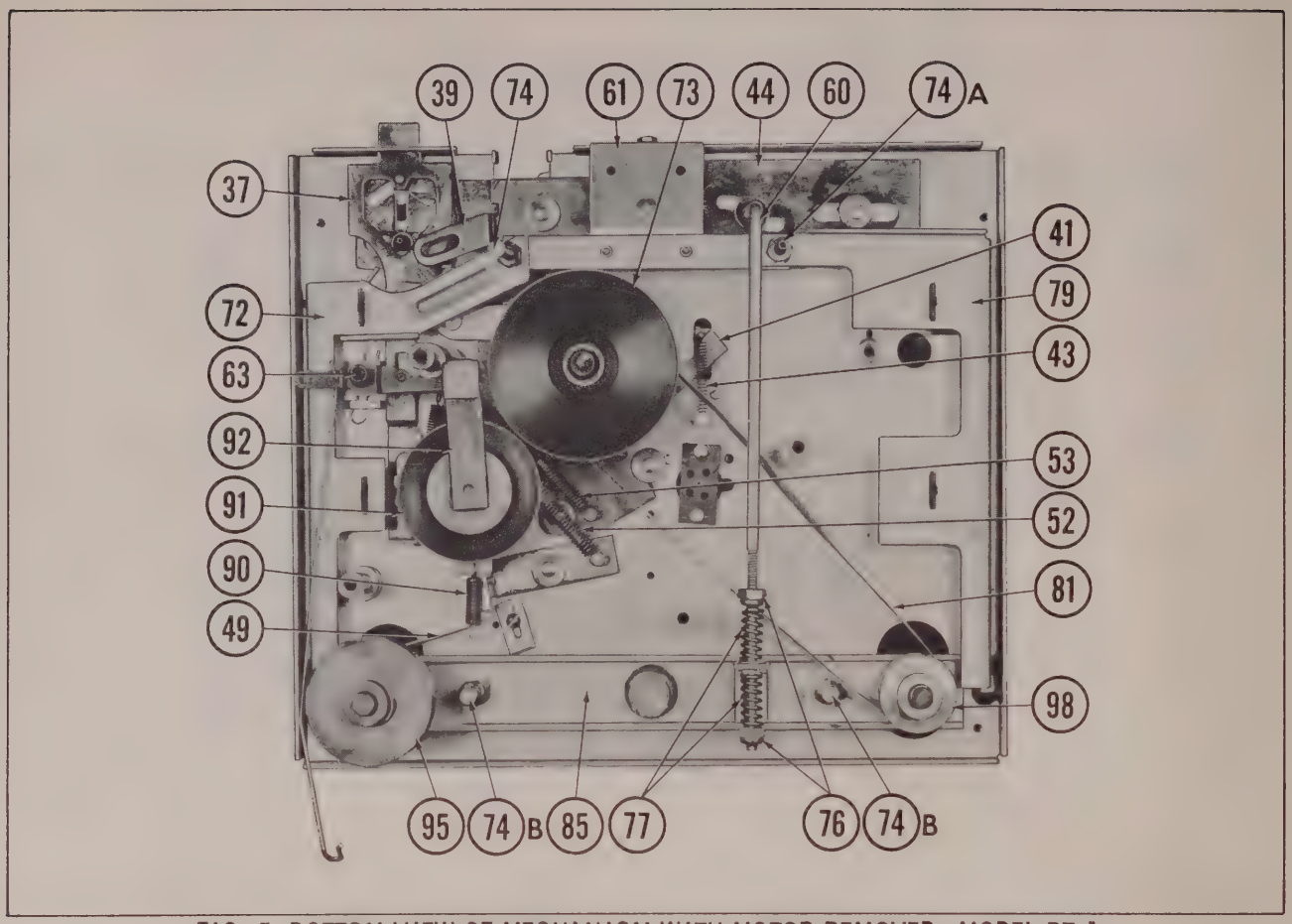


FIG. 5 BOTTOM VIEW OF MECHANISM WITH MOTOR REMOVED - MODEL PT-1

MECHANICAL ADJUSTMENTS

Equalizer Bar Adjustment

Loosen socket head set screw (25) and shift equalizer bar (85) forward or backward. Adjust as follows:

First, remove head cover casting (3), spindle caps (1), and reel rests (2). With the "Unimagic" control in neutral position, move equalizer bar (85) so that take-up spindle (88) is on the verge of spinning without any pressure being exerted on equalizer bar (85) from tie bar (60). After adjusting, be sure socket head screw (25) is tightened securely. Next, adjust equalizer bar adjustment screws (74B) by turning both screws down until they hit the mechanism plate. Then back the screws off 1/4 turn and lock them in place with lock nuts (75B). This adjustment acts as a stabilizer for the equalizer bar.

Tie Bar Pressure Adjustment

The amount of pressure exerted on equalizer bar (85) by tie bar (60) is adjusted by means of elastic stop nuts (77). The elastic stop nuts should be adjusted so the Forward and Rewind positions of the "Unimagic" control can function freely and still exert enough pressure on the equalizer bar for adequate fast forward and rewind. To determine whether performance is adequate, test the rewind with a full 7" reel on the feed side. To test for fast forward, place the full 7" reel on the take-up side.

NOTE: Tie bar (60) must be readjusted whenever equalizer bar (85) is adjusted.

Take-Up Adjustment

Bending take-up adjusting lever (49) closer to equalizer bar (85) increases the pressure on the equalizer bar, giving a stronger take up. Bending the lever away from the equalizer bar gives a weaker take up. If bending lever (49) does not give adequate results, loosen the screw mounting the lever and move the lever in the proper direction for best adjustment.

Brake Adjustment

After equalizer bar adjustments have been made, the brakes are ready to be adjusted. First put a full 5" reel of tape on the FEED REEL side, and an empty 7" reel on the TAKE-UP side. Wind about 1/4 of the tape on the 7" reel. While operating the "Unimagic" control from rewind to neutral, tighten left brake ad-

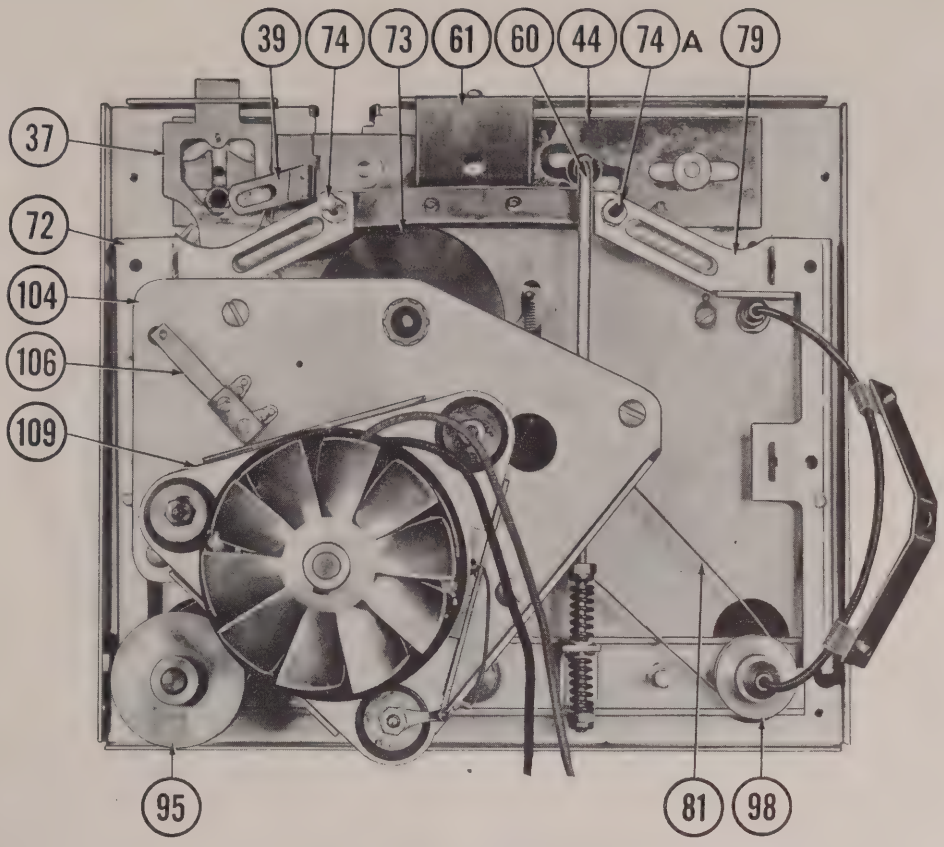


FIG. 6 BOTTOM VIEW OF MECHANISM - MODELS PT-72, PT-74, PT-W3

justing screw (74) until the reels stop in about one revolution without spilling tape. Next, reverse the procedure by placing the 5" reel of tape on the TAKE-UP side and the empty 7" reel on the FEED REEL side. Adjust right brake adjusting screw (74A) so the reels stop in about one revolution when going from fast forward to neutral. Next, place a full 7" reel of tape on the FEED REEL side and an empty 7" reel on the TAKE-UP side. Run about 100' of tape onto the take-up reel, then go directly into rewind. When the take-up reel is almost empty, place the "Unimagic" control in neutral. The reels should stop in about three or four revolutions without spilling tape. Next, reverse the procedure by placing the full 7" reel on the TAKE-UP side and rewind about 100' of tape on the FEED REEL. Go directly into fast forward until the FEED REEL is almost empty. Then place the "Unimagic" control in neutral. The reels should stop in about three or four revolutions without spilling tape. After the brakes are adjusted, check the take up and rewind. Readjust them if necessary. If it is difficult to get adequate take up, the brakes may have been adjusted too tightly. Readjust the brakes to correct this.

Idler and Speed Change Adjustment (Models PT-72, PT-74, and PT-W3)

Loosen the set screw and nut securing speed change shaft (66) to idler channel (67). Adjust position of the idler channel so the full perimeter of idler wheel (91) rides on the perimeter of motor pulley (96). The idler wheel should not ride on the edge of the motor pulley.

Play-Record Head Alignment

The play-record head is correctly aligned for azimuth when the magnetic gap is at an exact right angle with the direction of tape travel. One of the best ways to make an azimuth adjustment is with an alignment tape and a meter. A substitute method is to play back a recording and adjust the head for maximum high-frequency content in the output, as judged by ear. To use an alignment tape and meter:

1. Connect meter to the AMP output jack and set it for a low AC voltage range.

2. Slightly loosen the record head mounting screw so the head may pivot about this screw as a center but cannot slip up or down.

3. Play the alignment tape and adjust the Azmur-X spring-loaded screw for maximum output on the meter.

4. Make sure the head height has not been disturbed. The center line of the head and pole piece must be aligned so the pole piece is the same level as the tape guides and tape.

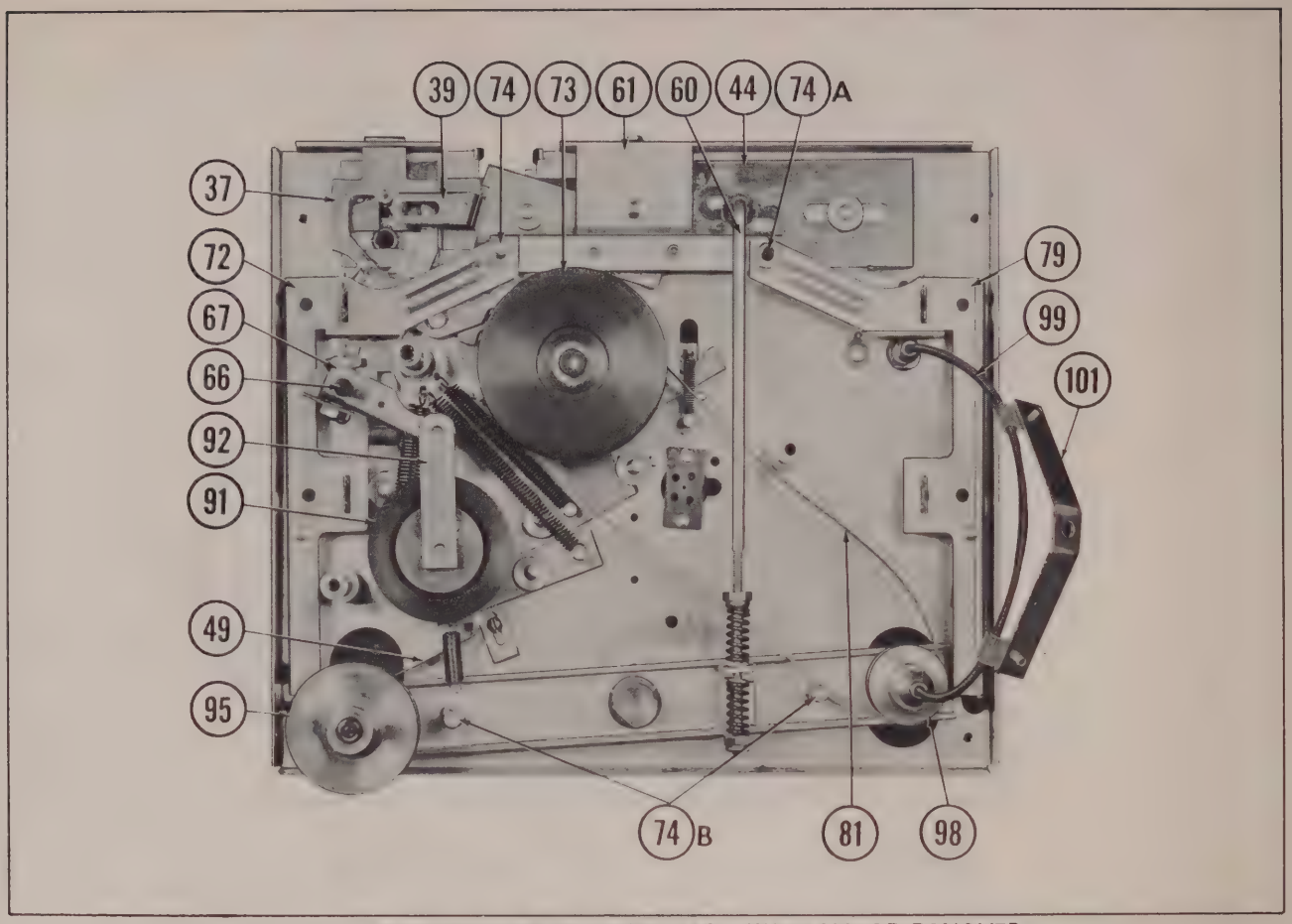


FIG. 7 BOTTOM VIEW OF MECHANISM WITH MOTOR REMOVED
MODELS PT-72, PT-74, PT-W3

5. Tighten the head mounting screw with a small amount of household cement.

Recording Level Indicator Adjustment (Model PT-1)

The neon lamp on the Model PT-1 recorder indicates the maximum undistorted recording level. Although set at the factory, it may require a minor adjustment.

If this is necessary, the following adjustment procedure is suggested:

1. Allow the recorder to warm up (usually about 5 minutes).

2. Insert a thin screwdriver through the AMP jack.

3. Set the VOLUME control at approximately 2 o'clock and make a normal recording, holding the microphone 4" to 6" from the mouth. Speak into the microphone at a normal conversational level.

4. Slowly turn the screwdriver until the neon bulb just flickers at the peak or loud portions of your voice.

To check the above setting, play back the recording to see whether the playback level is adequate and not distorted at normal listening levels.

If playback is weak, repeat Step 4 but slightly increase the VOLUME control.

If playback is loud and distorted, repeat Step 4 but slightly decrease the VOLUME control.

Depending upon the individual's voice, the above procedure may have to be repeated several times before the desired recording level as obtained.

CLEANING

The play-record and erase heads, the capstan (73), and pressure roller (23) accumulate tape coating oxide, which is worn off as it passes these parts. Clean parts. Clean them with a soft cloth and alcohol after every ten hours running time.

LUBRICATION

Although this mechanism is prelubricated at the factory, replacement parts require lubrication to properly function. No part needs more than a slight film of grease where grease is specified or one drop of oil where oil is specified.

The following parts require greasing with fibre grease or a similar compound:

1. Play-record cam (39).
2. Wind-rewind slide plate (44).
3. Control spring plate (61).
4. Control ball shaft (36A), bottom end.
5. Slide plate assembly (40).
6. Pressure roller bearing (23).
7. Belt pulley bearing (97).
8. Tie bar (60), front end.
9. Idler wheel bearing (91).
10. Record lock (35).
11. Equalizer bar pivot stud (87).
12. Take-up adjusting lever (56).
13. Pressure arm lever (41).
14. Pressure finger carrier assembly (34).

The following parts require oiling with 10W lubricating oil:

CAUTION: Do not clean oilite bearings with cleaning solvent. Oilite bearings are permanently lubricated. However, where the bearings appear dry, a drop of oil will be necessary.

1. Feed reel spindle (86).
2. Take-up reel spindle (88).
3. Flywheel assembly (73), top and bottom bearing.

PARTS REPLACEMENT

How To Replace a Pole Piece

Remove the head assembly by loosening the mounting screws holding the assembly. The pole piece is removed by inserting a nonmagnetic screwdriver between the head can and the pole piece and prying the pole piece loose by breaking the glue joint. The new pole piece is inserted between the two laminations provided for each leg of the pole piece. After the new pole piece is in position, it should be cemented from the sides with household cement. The head assembly is then screwed into place and the heads aligned.

How To Replace a Play-Record Head

Remove the #6-32 Phillips oval head mounting screw (4) and head cover casting (3). This gives access to the heads. Unsolder the head leads at the head plug socket. Loosen the Azmur-X adjustment screw and the head mounting screw (see Fig. 8A). The head can now be replaced. The head should be aligned for correct azimuth after replacement.

How To Replace a Pressure Roller

Remove the #6-32 Phillips oval head mounting screw (4) and head cover casting (3). Remove retaining ring (22) and lift off pressure roller (23). Clean pressure roller stud and clock steel washer (24) with a dry cloth. Grease the inside bottom of the new pressure roller. Place the new pressure roller on the pressure roller stud and wipe off any excess grease at the top of the roller. Replace retaining ring (22). Do not get any grease on the driving surface of the pressure roller, as this will hinder the operation of the machine.

How To Replace an Idler Wheel

Remove motor support plate (104) by taking the four #10-32 machine screws (105). This gives access to the idler wheel. Slide idler spring clip (89) forward and slip it off the shaft. Remove the clock steel washer and idler wheel from the idler stud. Clean the stud before installing the new idler wheel. Install idler wheel in reverse order, being careful not to get any grease on driving surface of wheel. Replace motor support plate (104).

How To Replace an Equalizer Bar

Remove spindle caps (1), reel rests (2), and head cover casting (3). Loosen the set screws on take up (95) and rewind pulley (98). Removed flexible shaft from feed reel spindle (86), Models PT-72, PT-74, and PT-W3. Lift out both reel spindles from top of unit and remove elastic stop nut (76) and spring (77) from end of tie bar (60). Remove socket head screw (25), equalizer pivot stud (87), and equalizer spacer (82). Equalizer bar (85) can now be removed and replaced. Clean all bearing surfaces and washers and lubricate properly before replacing bar. After new bar is installed, follow instructions for Equalizer Bar, Tie Bar, and Brake Adjustments.

How To Replace a Motor Assembly

Place "Unimagic" control in neutral. Remove the three nuts holding motor plate (109) to motor support plate (104). Lift motor and plate (109) off the three mounting studs on motor support plate (104). When replacing motor, make sure motor pulley (96) is outside the take-up belt (94) as shown in the Exploded View.

How To Replace a Take-Up Belt

Removal and replacement is probably easier if the back of the unit faces up. First, slip the belt off the take-up pulley (95). Start the belt up over the edge of pulley and assist the action by turning take-up reel seat by hand. Then remove the belt from belt pulley (97) by slipping the belt up through the clearance in motor support plate (104). Replace in reverse order. Make sure the lettering is on the inside of belt. Then slip the belt over belt pulley (97) by working it up

through the clearance in the motor support plate. Pull the belt around under motor pulley (96) and work it up between the motor pulley and motor mounting stud, toward take-up pulley (95). Slip the belt over the take-up pulley. Equalizer bar (85) and tie bar (60) may require readjusting after the new belt is installed.

How To Replace a Feed Belt

Turn the unit upside down and unplug the head plug. When working on Model PT-72, PT-74, or PT-W3, remove the flexible shaft from feed reel spindle (86). The belt can now be removed from rewind pulley (98), but motor support plate (104) must be removed before the belt can be taken off flywheel and capstan assembly (73). Remove the four #10-32 screws (105) and remove the motor support plate. Feed belt (81) can now be removed and replaced. Make sure new belt is installed with lettering on the outside. Reassemble in reverse order, making sure motor support plate (104) is properly seated on the studs.

MECHANICAL TROUBLES AND PROBABLE REMEDIES

SYMPTOM	CAUSE	REMEDY
No rewind.	1.Glazed idler wheel (91).	1.Rub off glaze with a clean, dry, lint free cloth.
	2.Faulty tie bar (60) adjustment.	2.Adjust as described under "Tie Bar Pressure Adjustment".
	3.Idler wheel (91) slips against flywheel or motor pulley.	3.Clean idler wheel, flywheel, and motor pulley with alcohol. If idler wheel still slips, replace.
	4.Idler wheel (91) not adjusted properly.	4.Adjust as described under "Idler And Speed Change Adjustment".
	5.Binding feed reel spindle (86).	5.Remove "E" ring (83) and remove spindle from bearing. Clean bearing and spindle with a clean, soft cloth.
	6.Dragging brake linings. Brakes not adjusted properly.	6.Adjust brakes as described under "Brake Adjustment".
	7.Warped reel rest (2).	7.Replace reel rest.
	8.Feed belt (81) loose or broken.	8.Replace.
Flutter.	1.Motor pulley (96) not concentric to motor shaft.	1.Replace motor and pulley assembly.
	2.Excessive take-up.	2.Adjust as described under "Take-Up Adjustment".
	3.Take-up belt (94) not installed properly.	3.Remove and replace belt as shown in "Exploded View".
	4.Dirty flywheel bearings.	4.Clean bearings and flywheel shaft with a clean, soft cloth.
Wow.	1.Foreign matter on idler wheel (91), motor pulley (96), flywheel (73), or take-up pulley (95).	1.Clean driving surfaces with a cloth and alcohol.
	2.Defective idler wheel (91).	2.Replace.
	3.Defective pressure roller (23).	3.Replace.
	4.Reel spindles (86) and (89) binding.	4.Remove "E" ring (83) on top of spindles and remove spindles from bearings. Clean bearings and spindles with a clean, soft cloth.
	5.Brakes improperly adjusted.	5.Adjust as described under "Brake Adjustment"
No Wind (Fast Forward).	1.Binding take-up spindle (88).	1.Remove "E" ring (83) on top of spindle and remove spindle from bearing. Clean bearing and spindle with a soft, clean cloth.
	2.Take-up belt (94) loose, twisted, or broken.	2.Replace belt.

MECHANICAL TROUBLES AND PROBABLE REMEDIES (CONT)

SYMPTOM	CAUSE	REMEDY
Tape spillage or insufficient braking.	1. Faulty brake adjustment.	1. Adjust brakes as described under "Brake Adjustment".
	2. Worn brake linings.	2. Replace linings and readjust brakes.
	3. Worn out or loose control spring (61).	3. Adjust or replace control spring.
	4. Excessive play in equalizer bar (85).	4. Readjust equalizer bar as described under "Equalizer Bar Adjustments".

ELECTRICAL TROUBLES AND PROBABLE REMEDIES

SYMPTOM	CAUSE	REMEDY
Poor high frequency response.	1. Play-Record head improperly aligned.	1. See "Play-Record Head Alignment".
	2. Worn pole piece on Play-Record head.	2. Replace pole piece and realign for azimuth.
No erase — distorted or weak record.	1. Bias-Erase oscillator not working.	1. Check oscillator tube and oscillator coil. Replace if necessary.
No erase — records on top of previous recording.	1. Defective erase head or circuits.	1. Check circuits. Replace head if necessary.
Distorted recording. Playback functions properly.	1. Improper recording level.	1. Check level indicator operation. Check setting of adjustment for level indicator (Model PT-1).
	2. Defective microphone.	2. Compare with microphone known to be good.

MECHANICAL PARTS LIST
PT-1, PT-72, PT-74, AND PT-W3

Ref. No.	Part No.	Description
1	714A-276	Reel Spindle Cap (Specify Color)
2	765B-12	Reel Rest (Specify Color)
3	824B-13	Head Cover Casting (For Model PT-1)
	824B-12	Head Cover Casting (For Model PT-72)
	824B-14	Head Cover Casting (For Model PT-74)
4	611-61633	#6-32x1 Phillips O.H.M.S.
5	814A-66	Speed Change Knob (Specify Color)
6	814A-61	Control Knob (Specify Color)
7	824D-2	Top Cover Casting (For Model TP-1)
		761D-50 Top Trim Plate (For Model PT-1)
	824B-10	Top Cover Casting (For Model PT-72)
	824B-11	Top Cover Casting (For Models PT-74 & PT-W3)
8	625-9163	Knurled Nut (For Models PT-72, PT-74 & PT-W3)
9	711A-708	Top Cover Panel (For Model PT-1)
	711D-60	Top Cover Panel (For Model PT-72)
	711D-61	Top Cover Panel (For Model PT-74)
10	612-60464	#6-32X1/4 Hex. Hd. Self Tap Screw

Ref. No.	Part No.	Description
11	963C-11	Head Assembly (For Models PT-72, PT-74, & PT-W3)
11A	964C-56	Record-Playback Head
11B	964B-132	Record-Playback Pole Piece
11C	964C-57	Double Gap Erase Head
11D	964B-134	Double Gap Erase Pole Piece
12	963C-12	Stacked Stereo and Double Gap Erase Head Assembly (For Models PT-1S, PT-72S, PT-74S, & PT-W3S)
12A	983A-8	Stacked Stereo Head
	964C-54	Combination Record-Play-Erase Head (Used in early production for Model PT-1. Not Shown on exploded view).
	964B-90	Pole Piece (For combination Record-Play-Erase Head)
13	611-80344	#8-32X3/16 F.H.M.S.
14	964A-335	Pressure Plate & Pad Assembly
14A	871A-22	Felt Pressure Pad
14B	619-144	.125 Crescent Retaining Ring

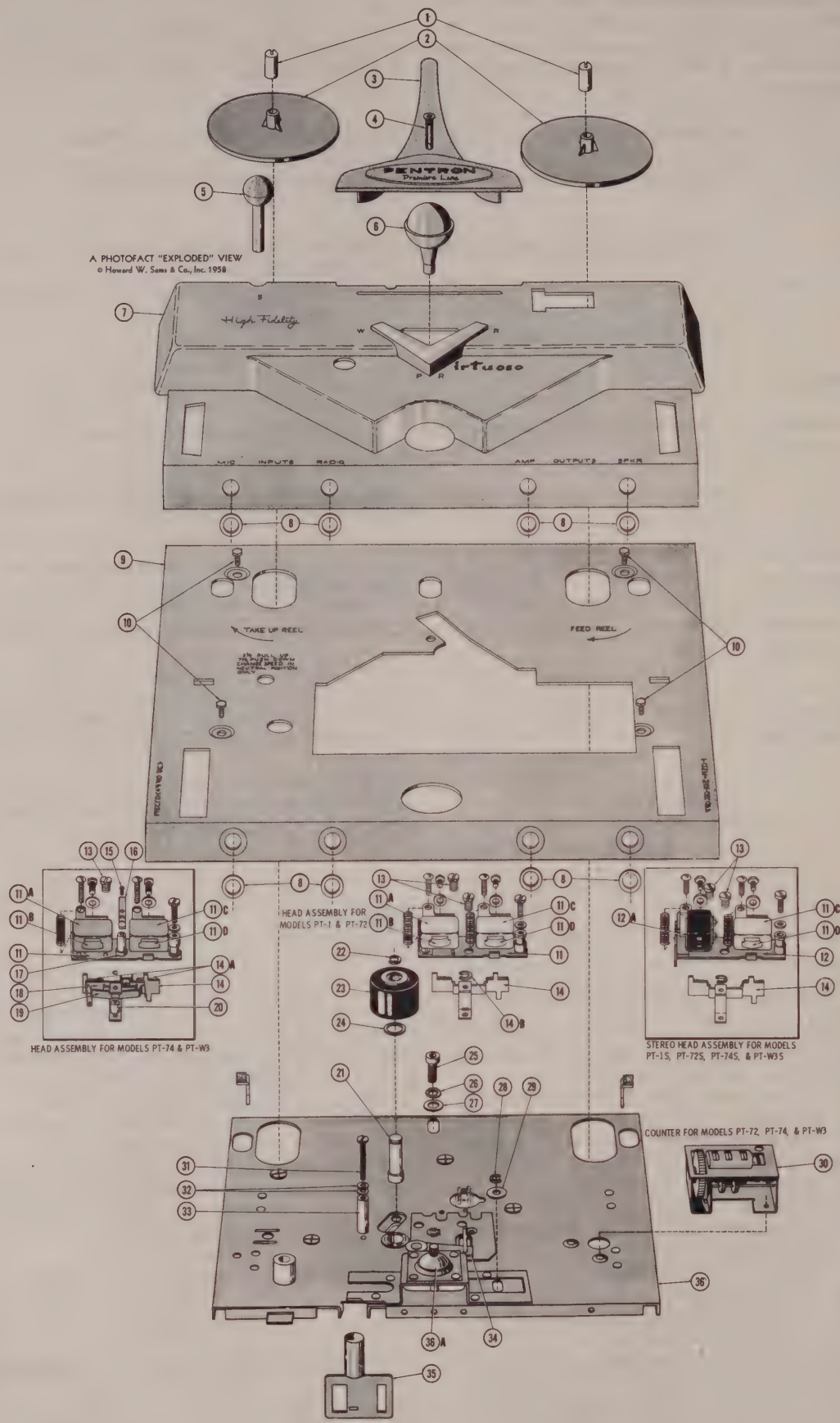

A PHOTOFACT "EXPLODED" VIEW
© Howard W. Sams & Co., Inc. 1958
PENTRON
Premiere Line
High Fidelity
virtuoso
MIC INPUTS RADIO
AMP OUTPUTS SPKR
TAKE UP REEL
FEED REEL
HEAD ASSEMBLY FOR MODELS PT-1 & PT-72
HEAD ASSEMBLY FOR MODELS PT-74 & PT-W3
STEREO HEAD ASSEMBLY FOR MODELS PT-1S, PT-72S, PT-74S, & PT-W3S
COUNTER FOR MODELS PT-72, PT-74, & PT-W3

FIG. 8A EXPLODED VIEW OF PARTS ABOVE BASEPLATE

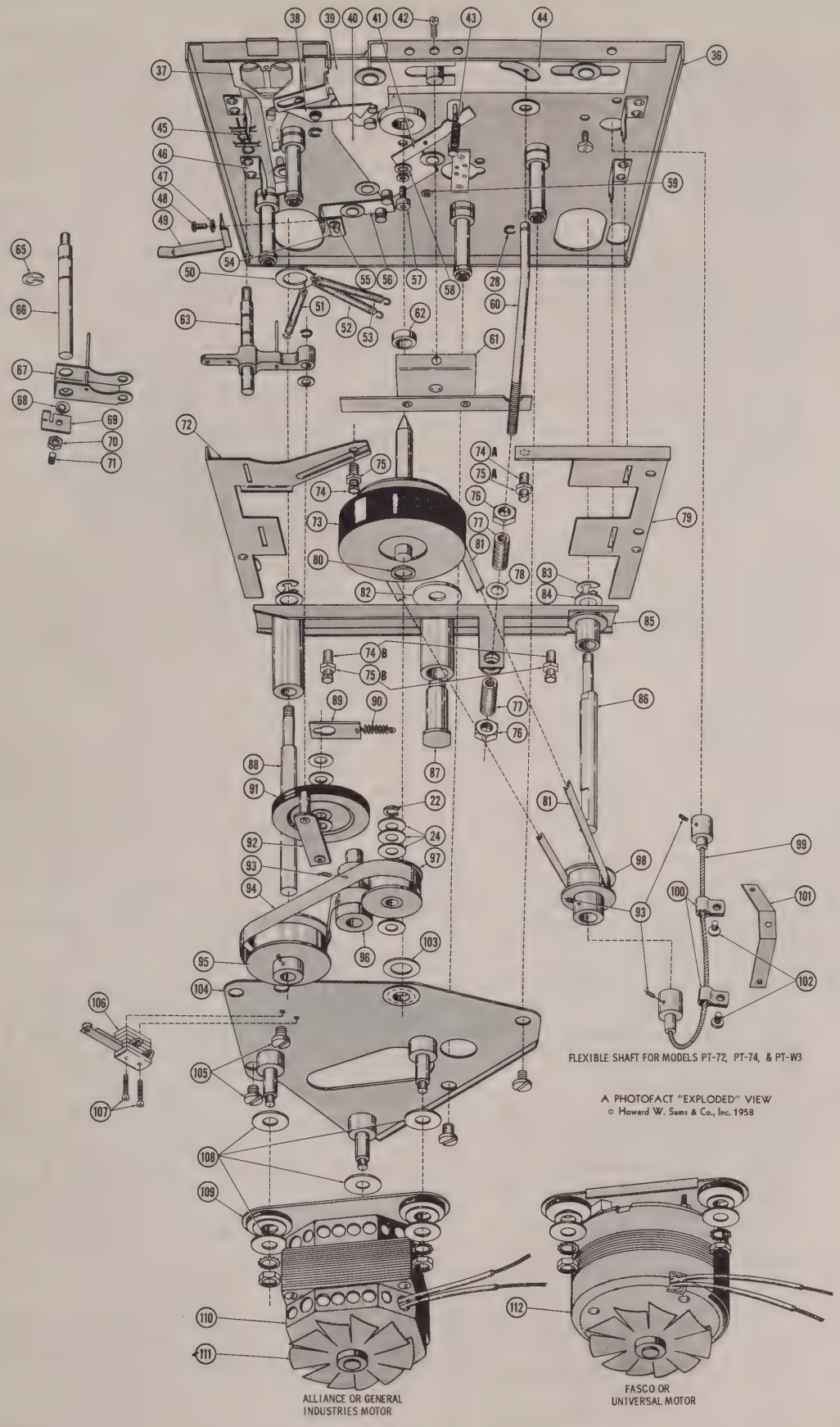
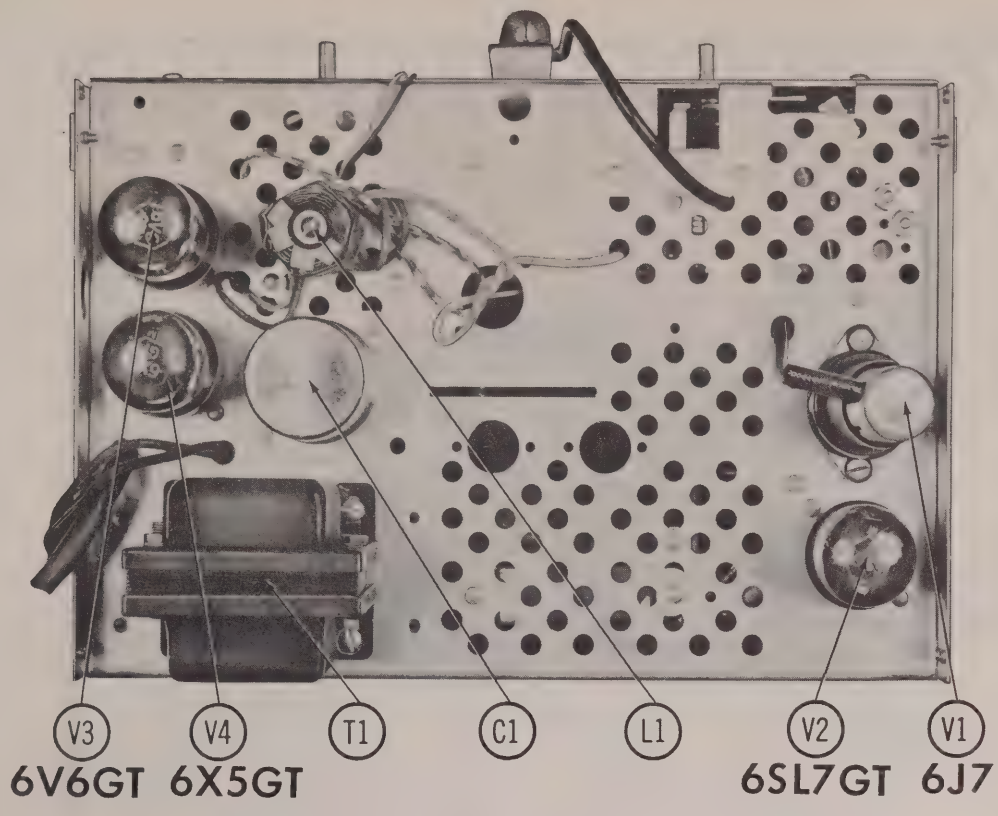
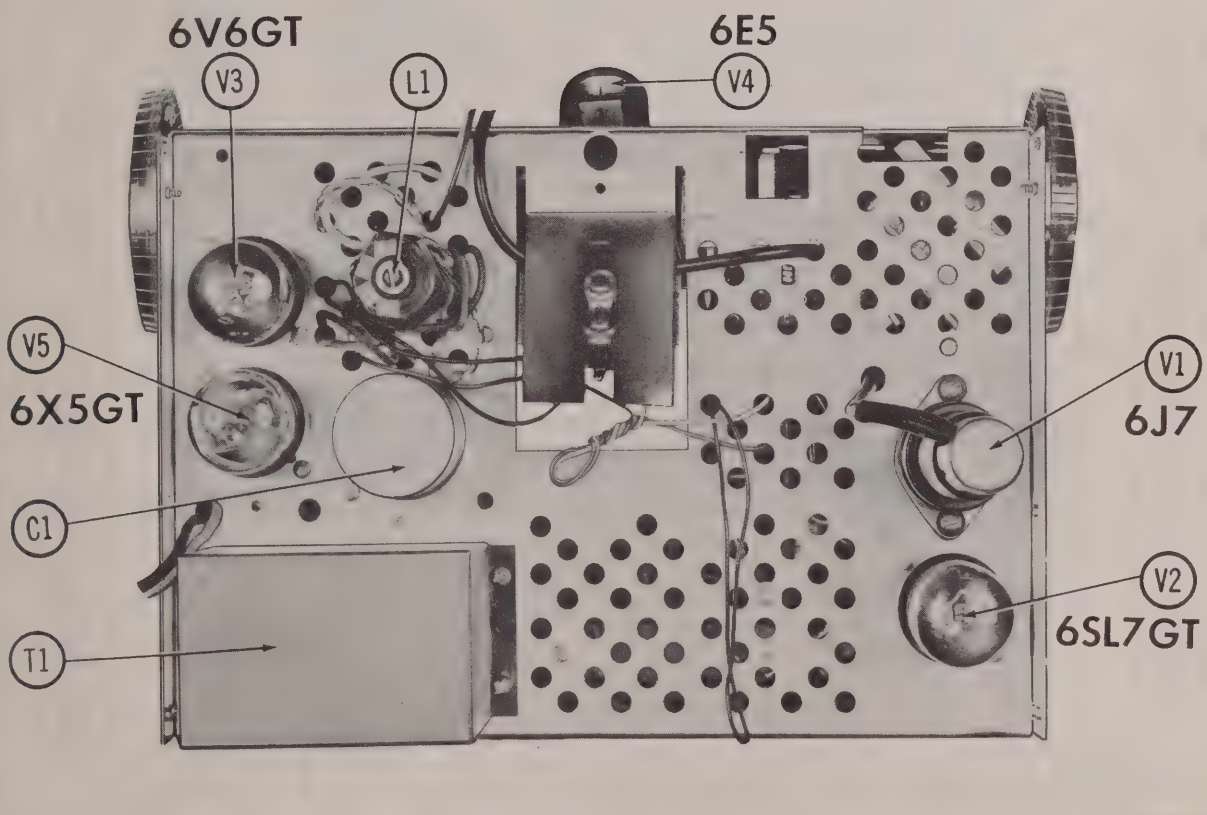

FLEXIBLE SHAFT FOR MODELS PT-72, PT-74, & PT-W3
A PHOTOFACT "EXPLODED" VIEW
© Howard W. Sams & Co., Inc. 1958
ALLIANCE OR GENERAL INDUSTRIES MOTOR
FASCO OR UNIVERSAL MOTOR

FIG. 8B EXPLODED VIEW OF PARTS BELOW BASEPLATE

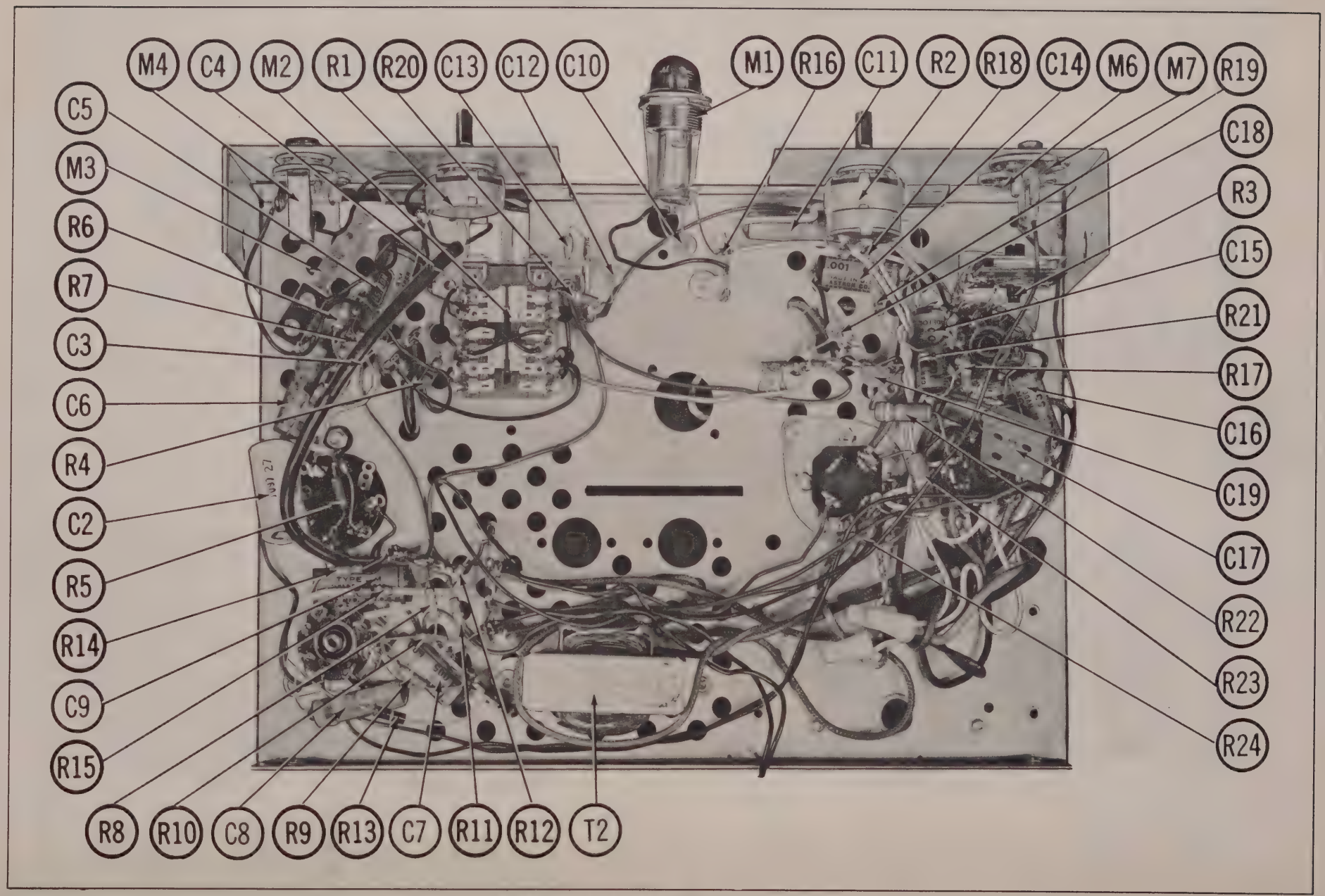
Ref. No.	Part No.	Description
15	611-20314	#2-56X3/16 R.H.M.S.
16	964A-334	Carrier Bracket Assembly
17	813A-11	Stud, Phenolic Rod
18	964A-333	Carrier Plate Assembly
19	742A-35	Cut-Off Switch Spring
20	813A-10	Spacer
21	714A-47	Capstan Pressure Roller Shaft
22	619A-148	.25 Crescent Retaining Ring
23	964A-116	Capstan Pressure Roller
24	616A-3169	.25 X .5 X .01 Clock Steel Washer
25	613-10896	#10-32X1/2 Socket Hd. Mtg. Screw
26	617-1134	#10 Ext. Tooth Lockwasher
27	616-1144	.203 X .438 X .031 Flat Steel Washer
28	619-146	3/16" Crescent Retaining Ring
29	616A-24	.19 X .38 X .01 Clock Steel Washer
30	498A-2	Counter (For Models PT-72, PT-74 & PT-W3)
31		#4-40X1 R.H.M.S.
32		Flat Washer, Steel
33	734A-31	Tape Post
34	964A-114	Pressure Finger Carrier Assembly
35	814-59	Record Lock Button Assembly
36	964D-35	Mech. Plate Rivet Ass'y. (For Models PT-1 & PT-72)
	964A-347	Mech. Plate Rivet Ass'y. (For Models PT-74 & PT-W3)
37	964C-51	Idler Release Lever Ass'y.
38	711A-709	Rocker Arm
39	964B-130	Play & Record Control Cam Ass'y.
40	964A-23	Slide Plate Ass'y.
41	711A-330	Pressure Arm Lever
42	612-60464	Screw, #6-32X1/4 Hex. Hd. Self Tap.
43	712A-75	Pressure Finger Spring
44	711B-164	Wind & Rewind Slide Plate
45	619A-47	Detent Spring
46	711B-161	Brake Clip
47	616-8124	.16 X .38 X .03 Flat Steel Washer
48	611-60454	#6-32X1/4 B.H.M.S.
49	711A-720	Take-Up Adjusting Lever
50	964A-338	Spring Ring Assembly
51	712A-80	Idler Lever Spring
52	712A-5	Take-Up Pressure Spring
53	712A-6	Pressure Roller Spring
54	711A-209	Idler Stop Plate
55	611-50313	#5-40X3/16 R.H.M.S.
56	964A-129	Take-Up Adjusting Lever Ass'y.
57	613-60496	#6-32X1/4 Socket Hd. M.S.
58	617-6094	#6 Int. Tooth Lockwasher
59	619-14-4	Crescent Retaining Ring, 1/8" Dia.
60	964A-291	Tie Bar Assembly
61	964A-336	Control Spring Plate Ass'y.
62	764A-18	Spacer
63	714A-530	Speed Change Shaft & Arm Ass'y. (For Model PT-1)
65	619-14-8	Crescent Retaining Ring, 1/4" Dia. Shaft
66	714A-336	Speed Change Shaft (For Models PT-72, PT-74, & PT-W3)
67	711A-343	Speed Change Idler Channel (For Models PT-72, PT-74, & PT-W3)
68	617-8114	#8 Int. Tooth Lockwasher (For Models PT-72, PT-74, & PT-W3)
69		Pause Rod Bracket (For Models PT-72, PT-74, & PT-W3)
70	614-8114	#8-32 Hex. Nut (For Models PT-72, PT-74, & PT-W3)
71		#8-32X3/8 Allen Hd. Set Screw (For Models PT-72, PT-74, & PT-W3)
72	964C-60	Left Brake Arm Assembly
72A	881A-52	Brake Cork Pad
73	964A-267	Flywheel & Capstan Ass'y.
74	611-81664	#8-32X1 Hex. Hd. M.S.
75	614-8114	#8-32 Hex. Nut
76	615-1124	#10-32 Elastic Stop Nut
77	712A-60	Compression Spring
78	616-1124	.203 X 3/8 X .047 Flat Steel Washer
79	964C-59	Right Brake Arm Assembly
79A	881A-52	Brake Cork Pad
80	871A-23	Flywheel Washer, Felt
81	899A-2	Feed Belt, .3125 X 17.25
82	714A-478	Equalizer Spacer
83	619A-20	"E" Ring, .313
84	616-7209	.63 X .31 X .01 Clock Steel Washer
85	964B-111	Equalizer Bar & Bearing Ass'y.
86	714A-463	Feed Reel Spindle
87	714A-183	Equalizer Pivot Stud
88	714A-462	Take-Up Reel Spindle
89	711A-346	Idler Spring Clip
90	712A-79	Idler Spring
91	964A-130	Idler Wheel
92	964A-139	Idler Bracket Sub Assembly
93	613-80306	#8-32X3/16 Allen Hd. Set Screw
94	899A-3	Take-Up Belt, .3125 x 12.625
95	964A-91	Take-Up Pulley Assembly
96	714A-167	Motor Pulley (60 Cycle)
	714-174	Motor Pulley (50 Cycle)
97	714A-171	Belt Pulley
98	714A-491	Rewind Pulley
99	529A-16	Flexible Shaft (For Models PT-72, PT-74, & PT-W3)
100	835A-6	Cable Clamp (For Models PT-72, PT-74, & PT-W3)
101	711A-597	Cable Clamp Support Bracket (For Models PT-72, PT-74, & PT-W3)
102	611-80454	#8-32X1/4 B.H.M.S. (For Models PT-72, PT-74, & PT-W3)
103	616A-9209	.377 X .625 X .01 Clock Steel Washer
104	964B-20	Motor Support Plate Assembly
	711B-75	Motor Support Plate
105	611-10454	#10-32X1/4 B.H.M.S.
106	532A-6	Speed Equalization Switch (For Models PT-72, PT-74, & PT-W3)
107		#5-40X11/16 F.H.M.S.
108	616-1240	.203 X .75 X .047 Steel Washer
109	711A-649	Motor Plate
110	367B-8	Alliance Motor
	367B-6	General Industries Motor
111	717A-20	Motor Fan with Set Screw
	964A-282	Motor Fan & Grommet Assembly
112	367B-15	Fasco Motor
	367B-12	Universal Motor
	964B-16	Motor & Pulley Assembly (60 Cycle)



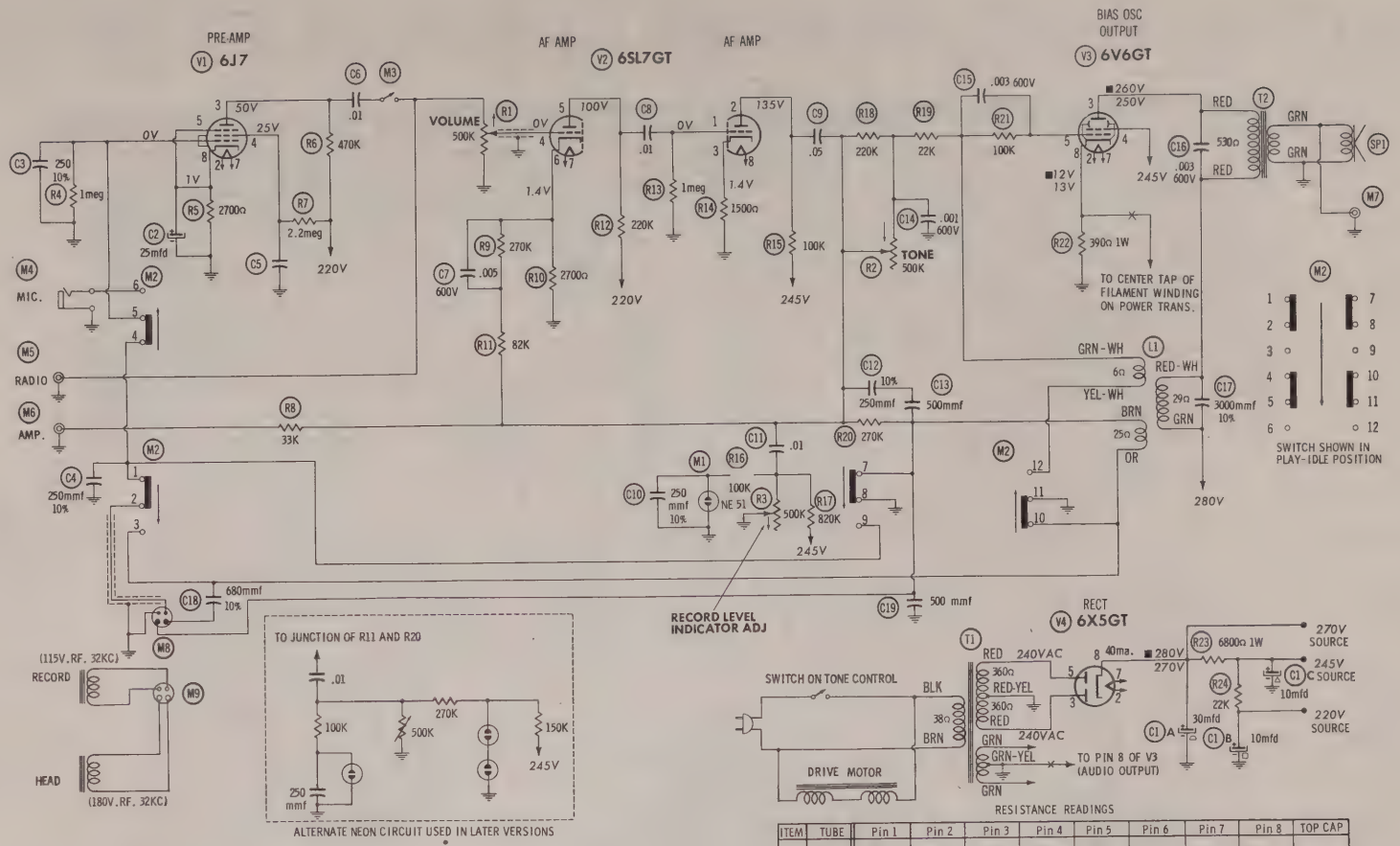
CHASSIS TOP VIEW - MODEL PT-1



CHASSIS TOP VIEW - MODEL PT-72



CHASSIS BOTTOM VIEW - MODEL PT-1



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	TOP CAP
V1	6J7	TP	390Ω	†500K	†2.2meg	2700Ω	NC	390Ω	2700Ω	1meg
V2	6SL7GT	1meg	†100K	1500Ω	0Ω	†240K	2700Ω	390Ω	390Ω	
V3	6V6GT	NC	390Ω	†560Ω	†6800Ω	270K ■100K	TP	390Ω	390Ω	
V4	6X5GT	TP	390Ω	360Ω	TP	560Ω	TP	390Ω	¶	

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED
† MEASURED FROM PIN 8 OF V4
■ MEASURED IN "RECORD" POSITION
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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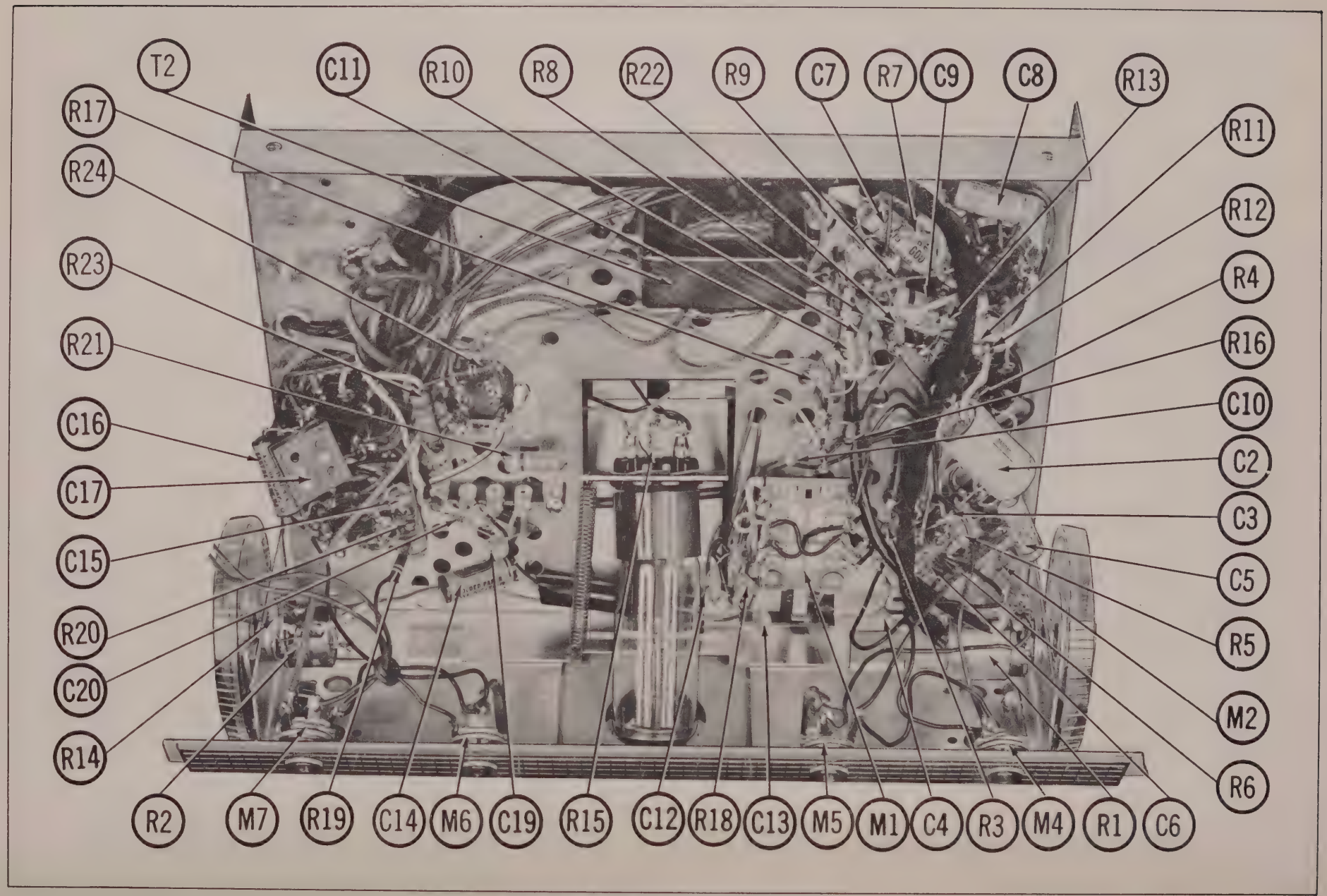
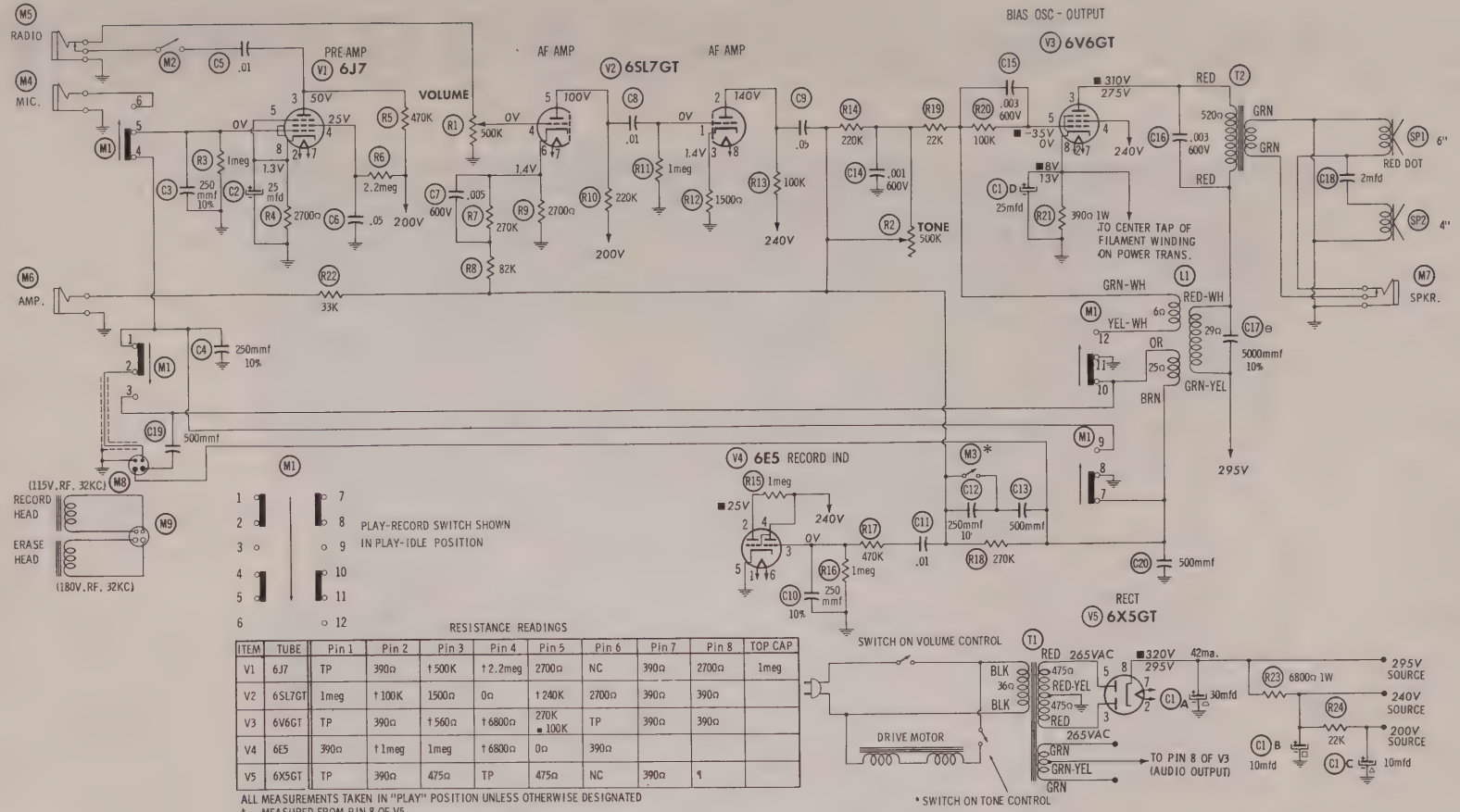
SCHEMATIC - MODEL PT-1

PENTRON MODELS PT-1, S, PT-72, S, PT-74, S, PT-W3, S



CHASSIS BOTTOM VIEW - MODEL PT-72



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	TOP CAP
V1	6J7	TP	390Ω	†500K	†2.2meg	2700Ω	NC	390Ω	2700Ω	1meg
V2	6SL7GT	1meg	†100K	1500Ω	0Ω	†240K	2700Ω	390Ω	390Ω	
V3	6V6GT	TP	390Ω	†560Ω	†6800Ω	270K ■ 100K	TP	390Ω	390Ω	
V4	6E5	390Ω	†1meg	1meg	†6800Ω	0Ω	390Ω			
V5	6X5GT	TP	390Ω	475Ω	TP	475Ω	NC	390Ω	¶	

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED
† MEASURED FROM PIN 8 OF V5
■ MEASURED IN "RECORD" POSITION
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.

*M3 SPEED EQUALIZATION SWITCH OPEN IN 7 1 2 POSITION

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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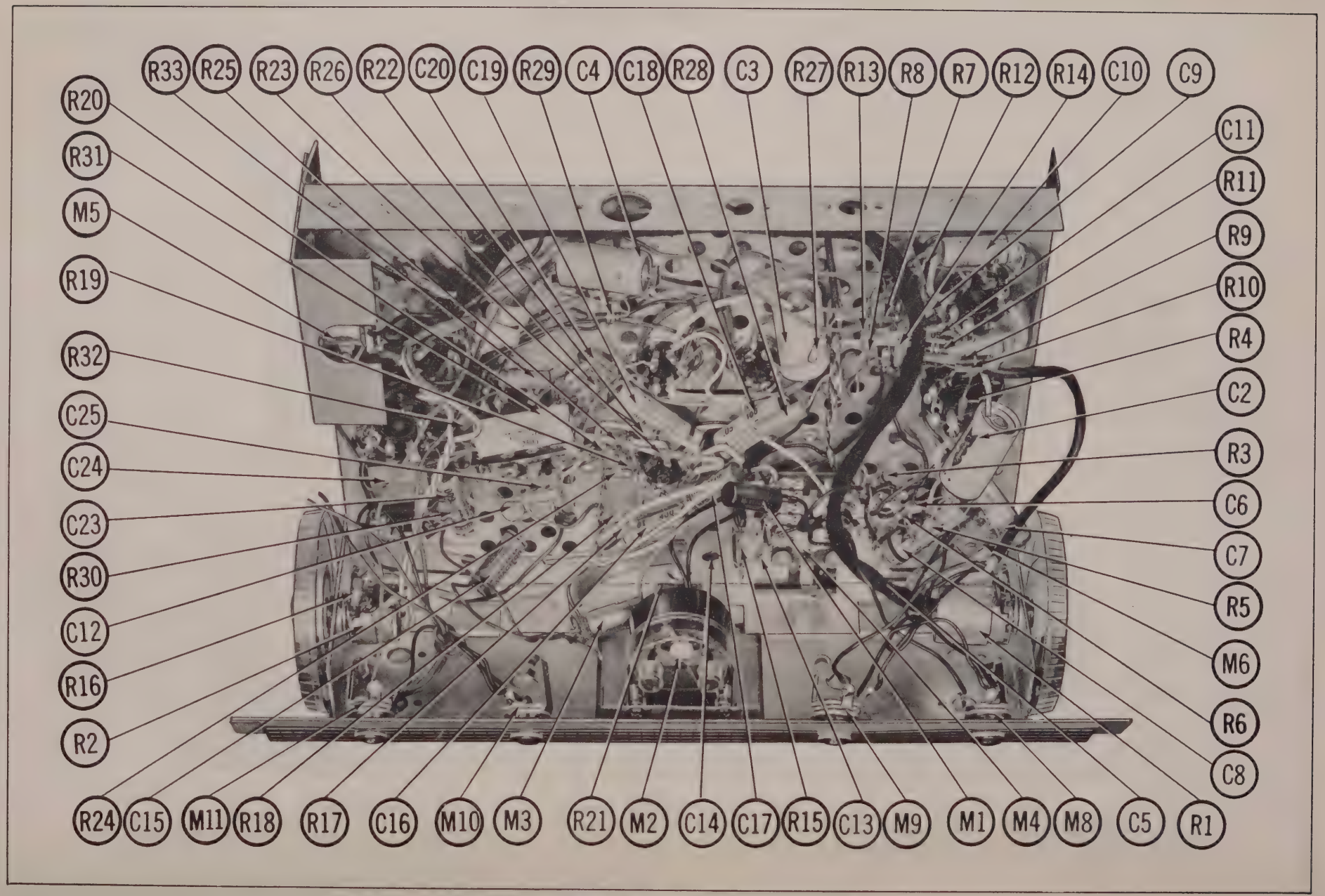
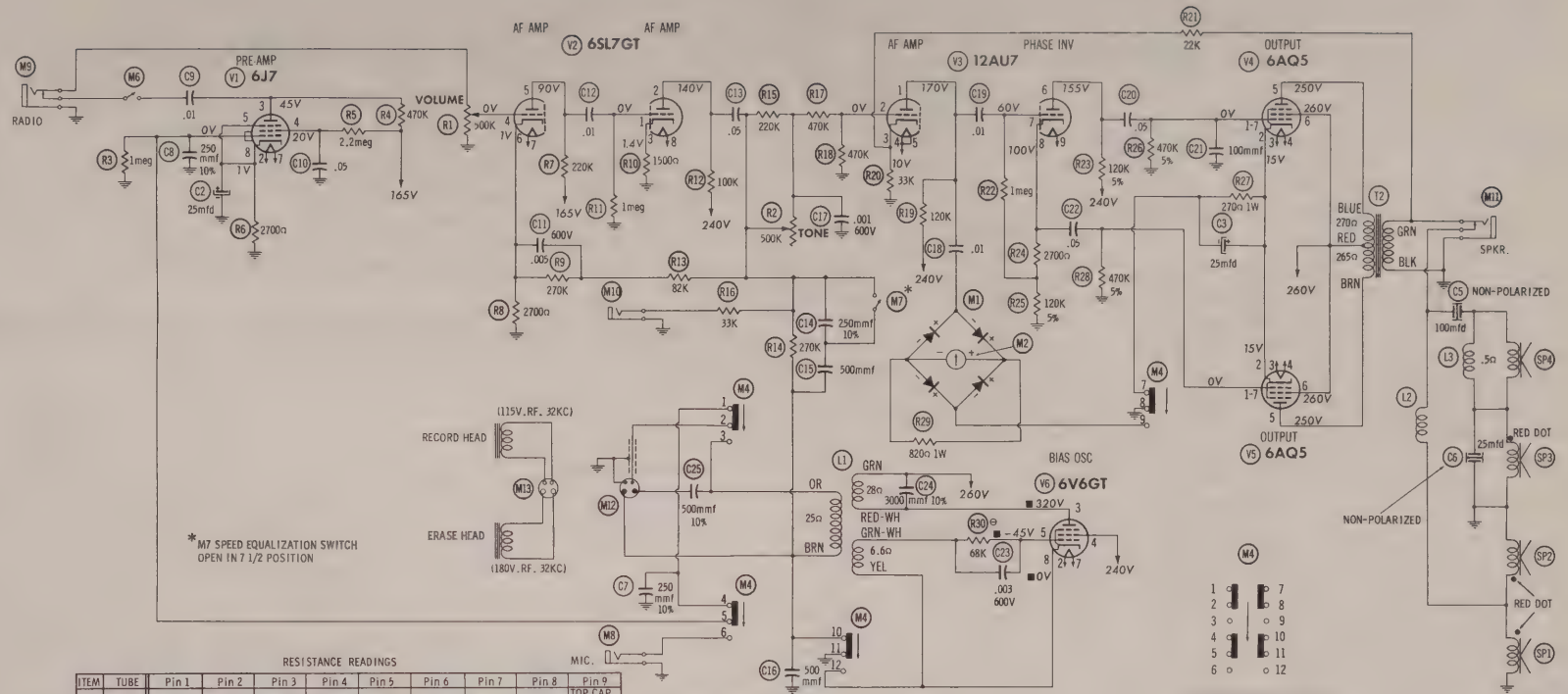
424-12

SCHEMATIC - MODEL PT-72

PENTRON MODELS PT-1, S, PT-72, S, PT-74, S, PT-W3, S



CHASSIS BOTTOM VIEW - MODELS PT-74, PT-W3



*M7 SPEED EQUALIZATION SWITCH OPEN IN 7 1/2 POSITION

PLAY-RECORD SWITCH SHOWN IN PLAY-IDLE POSITION

IN EARLY VERSIONS, SWITCH PORTION OF M5 IS LOCATED ON RELAY. IN LATE VERSIONS SWITCH M5 IS A MECHANICALLY OPERATED SHUT-OFF SWITCH LOCATED ON TRANSPORT MECHANISM.

IN LATE PRODUCTION VERSIONS USING MECHANICALLY OPERATED SHUT-OFF SWITCH DOTTED IN PARTS ARE USED AND POINT MARKED X IS BROKEN, DELETING RELAY CIRCUIT.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6J7	TP	.1Ω	†540K	†2.2meg	2700Ω	NC	.1Ω	2700Ω	TOP CAP 1meg
V2	6SL7GT	1meg	†100K	1500Ω	0Ω	†290K	2700Ω	.1Ω	.1Ω	
V3	12AU7A	†120K	470K	13K	.1Ω	.1Ω	†120K	1.1meg	120K	.1Ω
V4	6AQ5	470K	270Ω	.1Ω	.1Ω	†920Ω	†750Ω	470K		
V5	6AQ5	470K	270Ω	.1Ω	.1Ω	†915Ω	†750Ω	470K		
V6	6V6GT	TP	.1Ω	†780Ω	†1600Ω	INF ▪ 68K	TP	.1Ω	INF ▪ 0Ω	
V7	6X5GT	TP	.1Ω	160Ω	TP	180Ω	TP	.1Ω	¶	

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED
† MEASURED FROM PIN 8 OF V7
▫ MEASURED IN "RECORD" POSITION
▲ MEASURED FROM PIN 8 OF V3
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
NC NO CONNECTION
TP TIE POINT

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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PENTRON MODELS PT-1, S, PT-72, S, PT-74, S, PT-W3, S
SCHEMATIC - MODELS PT-74, PT-W3

PARTS LIST AND DESCRIPTIONS
PRE-AMP

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Pre-Amp	12AX7	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PENTRON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	25	25	273-25614	PRS25V25	BBR25-25	TC36	TD-25-25	MT-0225	TVA-1205

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PENTRON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	10000		227-10342	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C3	3000		263-3024	BPD-003	DD-302	BYA10D3	UC-523	5HK-D3	
C4	.05	400	263-50342	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PENTRON PART No.	NOTES
	OHMS	WATT		
R1	1meg		111-10521	
R2	2700Ω		111-27221	
R3	220K		111-22421	
R4	1meg		111-10521	

ITEM No.	RATING		PENTRON PART No.	NOTES
	OHMS	WATT		
R5	470K		111-47421	
R6	150K		111-15421	
R7	1500Ω		111-15221	
R8	100K		111-10421	

PARTS LIST AND DESCRIPTIONS AMP PT-1

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Pre-Amp	6J7	
V2	AF Amp	6SL7GT	

ITEM No.	USE	TYPE	NOTES
V3	Bias-Osc-Output	6V6GT	
V4	Rectifier	6X5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PENTRON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲ 30	350	285-50644	AFH4-68	D0390	FP457	TMQ-53	Q-330	R2711 *
B	■ 10	350			BR2035		TD-10-450	MT-4520	
C	▲ 10	350							
D	25	25	①						
C2	25	25	273-25614	PRS25V25	BBR25-25	TC36	TD-25-25	MT-0225	TVA-1205

①Not used in this application

* Non-Catalog Item

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PENTRON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	250		227-25151		MD-251	L10T25			10%
C4	250		227-25151		MD-251	L10T25			10%
C5	.05	400	263-50342	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C6	.01	400	263-10342	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C7	.005	600	263-50262	P688N-005	D6-502	CUB6D5	GEM-625	6TM-D5	
C8	.01	400	263-10342	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C9	.05	400	263-50342	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C10	250		227-25151		MD-251	L10T25			10%
C11	.01	400	263-10342	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C12	250		227-25151		MD-251	L10T25			10%
C13	500		227-50152	BPD-0005	DD-501	L10T5	UC-535	5GA-T5	
C14	.001	600	263-10262	P688N-001	D6-102	CUB6D1	GEM-625	6TM-D1	
C15	.003	600	263-30262	P688N-003	D6-302	CUB6D3	GEM-623	6TM-D3	
C16	.003	600	263-30262	P688N-003	D6-302	CUB6D3	GEM-623	6TM-D3	
C17	3000		232-30241	1464-003		1R5D3	MCB461	MS-23	10%
C18	680		227-68151		MD-681				10%
C19	500		227-50152	BPD-0005	DD-501	L10T5	UC-535	5GA-T5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PENTRON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	124-50413-7	B-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	500K	½	126-50413-4	B-60	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	On-Off
R3A	500K	½	129-50413	B-59	B47-500K-S	B11-133	PTA55L	Record Level Indicator Adj.
B	Shaft			Not Req.	SK2	SK2	Not Req.	

* Use KR-1 with CRL "Red Label" controls and KB-1 with "Blue Label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PENTRON PART No.	NOTES
	OHMS	WATT		
R4	1meg		111-10521	
R5	2700Ω		111-27221	
R6	470K		111-47421	
R7	2.2meg		111-22521	
R8	33K		111-33321	
R9	270K		111-27421	
R10	2700Ω		111-27221	
R11	82K		111-82321	
R12	220K		111-22421	
R13	1meg		111-10521	
R14	1500Ω		111-15221	

ITEM No.	RATING		PENTRON PART No.	NOTES
	OHMS	WATT		
R15	100K		111-10421	
R16	100K		111-10421	
R17	820K		111-82421	
R18	220K		111-22421	
R19	22K		111-22321	
R20	270K		111-27421	
R21	100K		111-10421	
R22	390Ω	1	111-39131	
R23	6800Ω	1	111-68231	
R24	22K		111-22321	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	PENTRON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC	480VCT @.040A	6.3VCT @1.5A	352A-28	P9210	P-3147		PC8418	24R11U	R-4A①
	@.275A									

①Drill New Mounting Holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PENTRON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6800Ω	3-4Ω	342-12	Z1007	A-3019	AU-600	A-3849	26S49	S-5Z	

PARTS LIST AND DESCRIPTIONS (Continued)

COIL

ITEM No.	USE	REPLACEMENT DATA					
		PENTRON PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Bias Osc.	311A-13					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PENTRON PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	345B-19	6A1	

MISCELLANEOUS

ITEM No.	PART NAME	PENTRON PART No.	NOTES
M1	Lamp	423A-2	NE51
M2	Switch	534A-3	Play-Record (Slide Type)
M3	Switch	532A-6	Pre-Amp. Muting (SPST Leaf Type)
M4	Jack	552A-13	Mic.
M5	Jack	552-6	Radio
M6	Jack	552-6	Amp.
M7	Jack	552-6	Spkr.
M8	Plug	564-2	Four Pin
M9	Socket	554A-3	Four Pin

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PARTS LIST AND DESCRIPTIONS AMP PT-72

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Pre-Amp	6J7	
V2	AF Amp	6SL7GT	

ITEM No.	USE	TYPE	NOTES
V3	Bias-Osc-Output	6V6GT	
V4	Record Ind.	6E5	
V5	Rectifier	6X5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PENTRON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲30	350	285-50644	AFH4-68	D0390	FP457	TMQ-53	Q-330	R2711*
B	■10	350			BR2035		TD-10-450	MT-4520	
C	▲10	350							
D	25	25							
C2	25	25	273-25614	PRS25V25	BBR25-25	TC36	TD-25-25	MT-0225	TVA-1205

* Non-Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PENTRON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	250		227-25151		MD-251	L10T25			10%
C4	250		227-25151		MD-251	L10T25			10%
C5	.01	400	263-10342	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C6	.05	400	263-50342	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PENTRON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C7	.005	600	263-50262	P688N-005	D6-502	CUB6D5	GEM-625	6TM-D5	
C8	.01	400	263-10342	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C9	.05	400	263-50342	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C10	250		227-25151		MD-251	L10T25			10%
C11	.01	400	263-10342	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C12	250		227-25151		MD-251	L10T25			10%
C13	500		227-50152	BPD-0005	DD-501	L10T5	UC-535	5GA-T5	
C14	.001	600	263-10262	P688N-001	D6-102	CUB6D1	GEM-625	6TM-D1	
C15	.003	600	263-30262	P688N-003	D6-302	CUB6D3	GEM-623	6TM-D3	
C16	.003	600	263-30262	P688N-003	D6-302	CUB6D3	GEM-623	6TM-D3	
C17	5000		232-50242	1464-005		1DR5D5	MCB465	MS-25	10% ①
C18	2.	50	263-20513						
C19	500		227-50152	BPD-0005	DD-501	L10T5	UC-535	5GA-T5	
C20	500		227-50152	BPD-0005	DD-501	L10T5	UC-535	5GA-T5	

①Some versions may use 3000mmf in this application (Part #232-3024i).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PENTRON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	126-50413-4	B-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	On-Off
R2A	500K	½	126-50413-4	B-60	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	Motor On-Off

* Use KR-1 with CRL "Red Label" controls and KB-1 with "Blue Label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PENTRON PART No.	NOTES
	OHMS	WATT		
R3	1meg		111-10521	
R4	2700Ω		111-27221	
R5	470K		111-47421	
R6	2.2meg		111-22521	
R7	270K		111-27421	
R8	82K		111-82321	
R9	2700Ω		111-27221	
R10	220K		111-22421	
R11	1meg		111-10521	
R12	1500Ω		111-15221	
R13	100K		111-10421	

ITEM No.	RATING		PENTRON PART No.	NOTES
	OHMS	WATT		
R14	220K		111-22421	
R15	1meg		111-10521	
R16	1meg		111-10521	
R17	470K		111-47421	
R18	270K		111-27421	
R19	22K		111-22321	
R20	100K		111-10421	
R21	390Ω	1	111-39131	
R22	33K		111-33321	
R23	6800Ω	1	111-68231	
R24	22K		111-22321	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	PENTRON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @.33A	530VCT @.042A	6.3VCT @1.84A	352A-17					25R02①	

①Drill New Mounting Hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PENTRON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5800Ω	2-3Ω	342-12	Z1007	A-3019	AU-600	A-3849	26S49	S-5Z	

COILS

ITEM No.	USE	REPLACEMENT DATA					
		PENTRON PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Bias Osc.	311A-13					

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PENTRON PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	345B-19	6A1	
SP2	4"	PM	3-4Ω	345-18	4A07	

MISCELLANEOUS

ITEM No.	PART NAME	PENTRON PART No.	NOTES
M1	Switch	534A-3	Play-Record (Slide Type)
M2	Switch	532A-6	Pre-Amp Muting (SPST Leaf Type)
M3	Switch	532A-6	Speed Equalization (SPST Leaf Type)
M4	Jack	552A-13	Mic.
M5	Jack	552-1	Radio
M6	Jack	552A-13	Amp.
M7	Jack	552-1	Spkr.
M8	Plug	564-2	Four Pin
M9	Socket	554A-3	Four Pin

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PARTS LIST AND DESCRIPTIONS AMP PT-74 & PT-W3

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Pre-Amp	6J7	
V2	AF Amp	6SL7GT	
V3	AF Amp-Phase Inv.	12AU7A	

ITEM No.	USE	TYPE	NOTES
V4	Output	6AQ5	
V5	Output	6AQ5	
V6	Bias Osc.	6V6GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PENTRON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	450	285-90694	AFH4-18-10	D0171	FP446	TMQ-18	Q-060	TVL-4771.8
B	■30	450					TD-10-450	MT-4510	
C	▲10	350							
D	10	350							
C2	25	25	273-25614	PRS25V25	BBR25-25	TC36	TD-25-25	MT-0225	TVA-1205
C3	25	25	273-25614	PRS25V25	BBR25-25	TC36	TD-25-25	MT-0225	TVA-1205
C4	100	6	273-10796	PRS6V100	BBR100-6	TT6X100	TD-100-6	MTH-0610	TVA-1101
C5	100	50NP	293-10713		BR20015 †		†TD-200-150		R2710*
					BR20015		†TD-200-150		
C6	25	50NP	293-25613		BR505 †	TC39 †	TD-50-50†	MT-0550	R2709*
					BR505	TC39	TD-50-50	MT-0550†	

† Connect Negative Leads Together

* Non-Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PENTRON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C7	250		227-25151		MD-251	L10T25			10%
C8	250		227-25151		MD-251	L10T25			10%
C9	.01	400	263-10342	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	

PARTS LIST & DESCRIPTION (continued)

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PENTRON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C10	.05	400	263-50342	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C11	.005	600	263-50262	P888N-005	D6-502	CUB6D5	GEM-625	6TM-D5	
C12	.01	400	263-10342	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C13	.05	400	263-50342	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C14	250		227-25151		MD-251	L10T25			10%
C15	500		227-50152	BPD-0005	DD-501	L10T5	UC-535	5GA-T5	
C16	500		227-50152	BPD-0005	DD-501	L10T5	UC-535	5GA-T5	
C17	.001	600	263-10262	P888N-001	D6-102	CUB6D1	GEM-621	6TM-D1	
C18	.01	400	263-10342	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C19	.01	400	263-10342	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C20	.05	400	263-50342	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C21	100		232-10152	1468-0001	DD-101	22R5T1	MC235	1FM-31	
C22	.05	400	263-50342	P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C23	.003	600	263-30262	P688N-003	D6-302	CUB6D3	GEM-623	6TM-D3	
C24	3000		232-30241	1464-003		1R5D3	MCB463	MS-23	10%
C25	500		232-50151	1469-0005	MD-501	5R5T5	MCB245	MS-35	10%

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	PENTRON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	126-50413-4	B-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	On-Off
R2A	500K	½	126-50413-4	B-60	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	Relay

* Use KR-1 with CRL "Red Label" controls and KB-1 with "Blue Label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PENTRON PART No.	NOTES
	OHMS	WATT		
R3	1meg		111-10521	
R4	470K		111-47421	
R5	2.2meg		111-22521	
R6	2700Ω		111-27221	
R7	220K		111-22421	
R8	2700Ω		111-22721	
R9	270K		111-22421	
R10	82K		111-82321	
R11	1meg		111-10521	
R12	100K		111-10421	
R13	1500Ω		111-15221	
R14	270K		111-27421	
R15	220K		111-22421	
R16	33K		111-33321	
R17	470K		111-47421	
R18	470K		111-47421	

ITEM No.	RATING		PENTRON PART No.	NOTES
	OHMS	WATT		
R19	120K		111-12421	
R20	33K		111-33321	
R21	22K		111-22321	
R22	1meg		111-10521	
R23	120K 5%		111-12425	
R24	2700Ω		111-27221	
R25	120K 5%		111-12425	
R26	470K 5%		111-47425	
R27	270Ω	1	111-27131	
R28	470K 5%		111-47425	
R29	820Ω	1	111-82132	
R30	68K		111-68321	Note 1
R31	750Ω	7	151-75191	
R32	820Ω	1	111-82132	
R33	68K	1	111-68332	

Note 1. Some versions may use 47K in this application (Part # 111-47321).

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	PENTRON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .5A	575VCT @ .070A	6.3VCT @ 2.8A	352-33					22R02①	

① Fabricate Mounting

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PENTRON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7000Ω CT	3-4Ω	342A-19	Z1009 ①	A-2901	AU-606	A-3870	22S58	S-55X	① Drill New Mounting Hole.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		PENTRON PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Bias Osc.	311A-13					
L2	Speaker Choke	341A-2					

CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	PENTRON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L3		.5Ω	430MMH	Part of SP4						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PENTRON PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	345-15	6A1	① Part # Includes (L3)
SP2	6"	PM	3-4Ω	345-15	6A1	
SP3	6"	PM	3-4Ω	345B-19	6A1	
SP4	4"	PM	4-5Ω	345-21①	4A1TZ4.2	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	PENTRON PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1		454-9		60-8694		

MISCELLANEOUS

ITEM No.	PART NAME	PENTRON PART No.	NOTES
M2	Meter	478A-5	Record Level
M3	Lamp	422-51	#47
M4	Switch	534A-3	Play-Record (Slide Type)
M5	Relay	534A-15	Drive Motor
M6	Switch	532A-6	Pre-Amp. Muting (SPST Leaf Type)
M7	Switch	532A-6	Speed Equalization (SPST Leaf Type)
M8	Jack	552A-13	Mic.
M9	Jack	552-1	Radio
M10	Jack	552A-13	Amp.
M11	Jack	552-1	Spkr.
M12	Plug	564-2	Four Pin
M13	Socket	554A-3	Four Pin

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

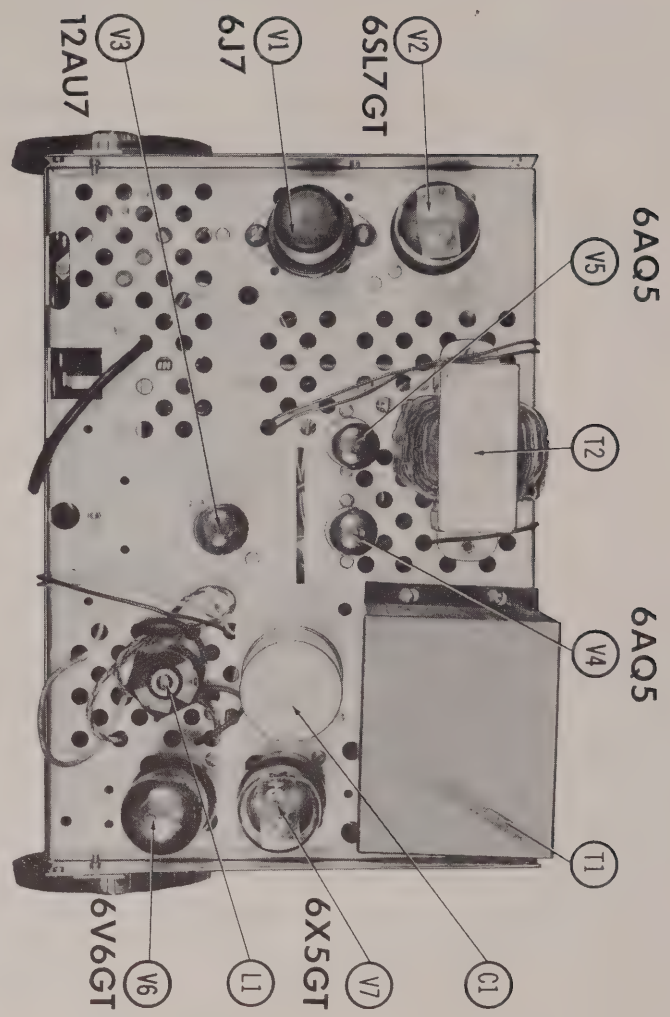
NAME	PART NO.	DESCRIPTION
Knob	824B-17-1	Control, Gray
Knob	824B-17-2	Control, Brown
Knob	714A-276	Speed Shift Lever
Cover	964D-90	Top Casting (Includes Trim Plate Assembly)Model NL-1
Cover	964A-371	Top Casting (Includes Trim Plate Assembly)Model NL-2
Cover	964A-372	Top Casting (Includes Trim Plate Assembly)Model NL-3
Panel	711A-708	Top Cover, Model NL-1
Panel	711D-62	Top Cover, Model NL-2
Panel	711D-64	Top Cover, Model NL-3

PARTS LIST & DESCRIPTION (continued)

WIRING DATA

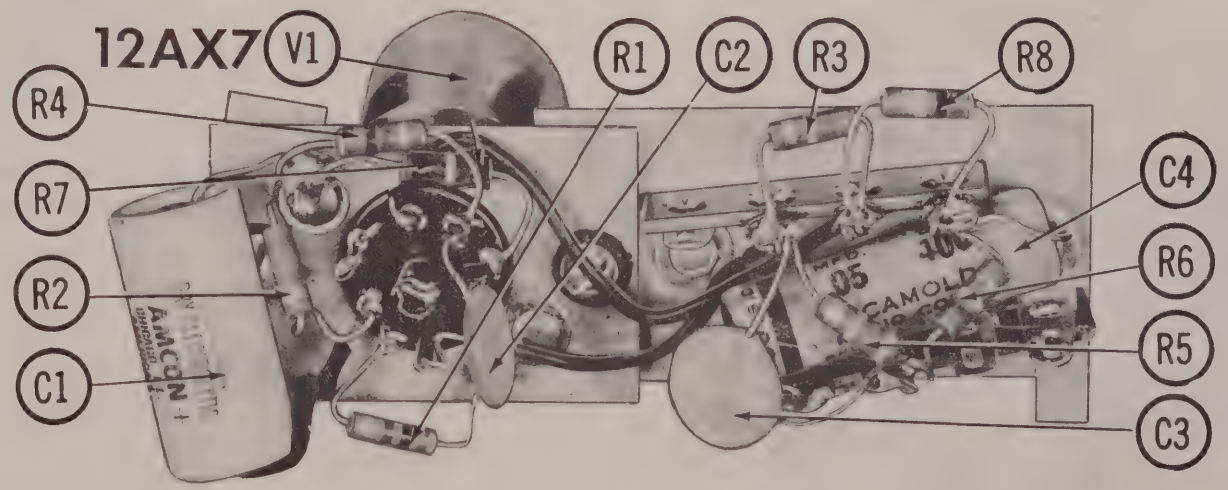
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—REAR VIEW

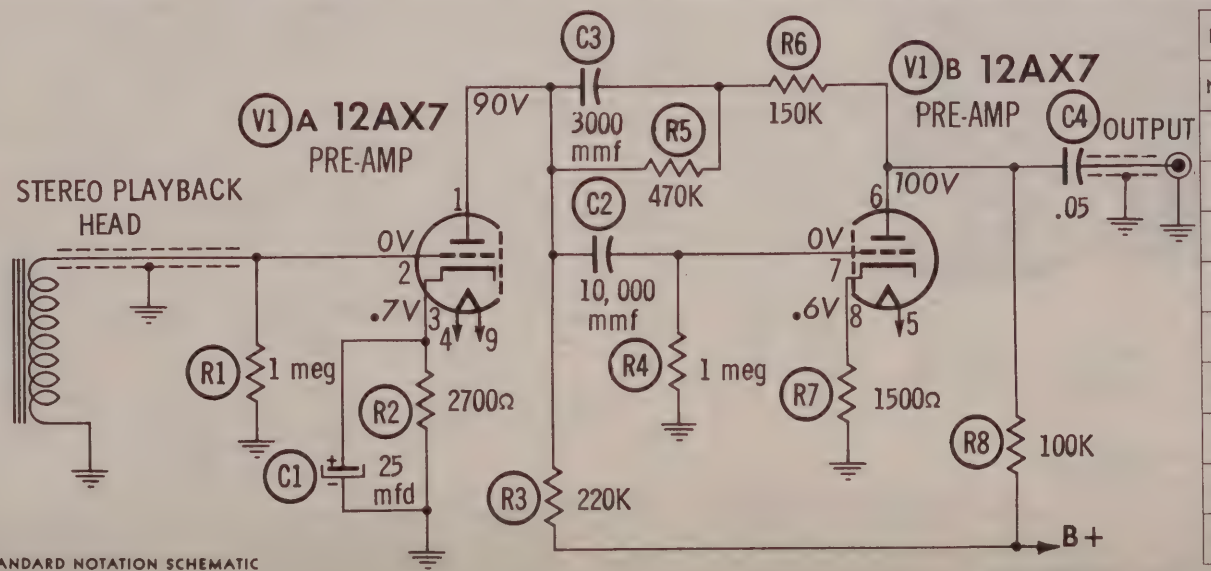


PENTRON MODELS PT-1, S, PT-72, S, PT-74, S, PT-W3, S

STEREO PREAMPLIFIER - BOTTOM VIEW



STEREO PREAMPLIFIER SCHEMATIC



Pin No.	V1 12AX7
1	† 220K
2	1meg
3	2700Ω
4	.1Ω
5	.1Ω
6	† 150K
7	1meg
8	1500Ω
9	.1Ω

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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† MEASURED FROM PIN 8 OF V7 OF MODEL PT-74 (Page 23)

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

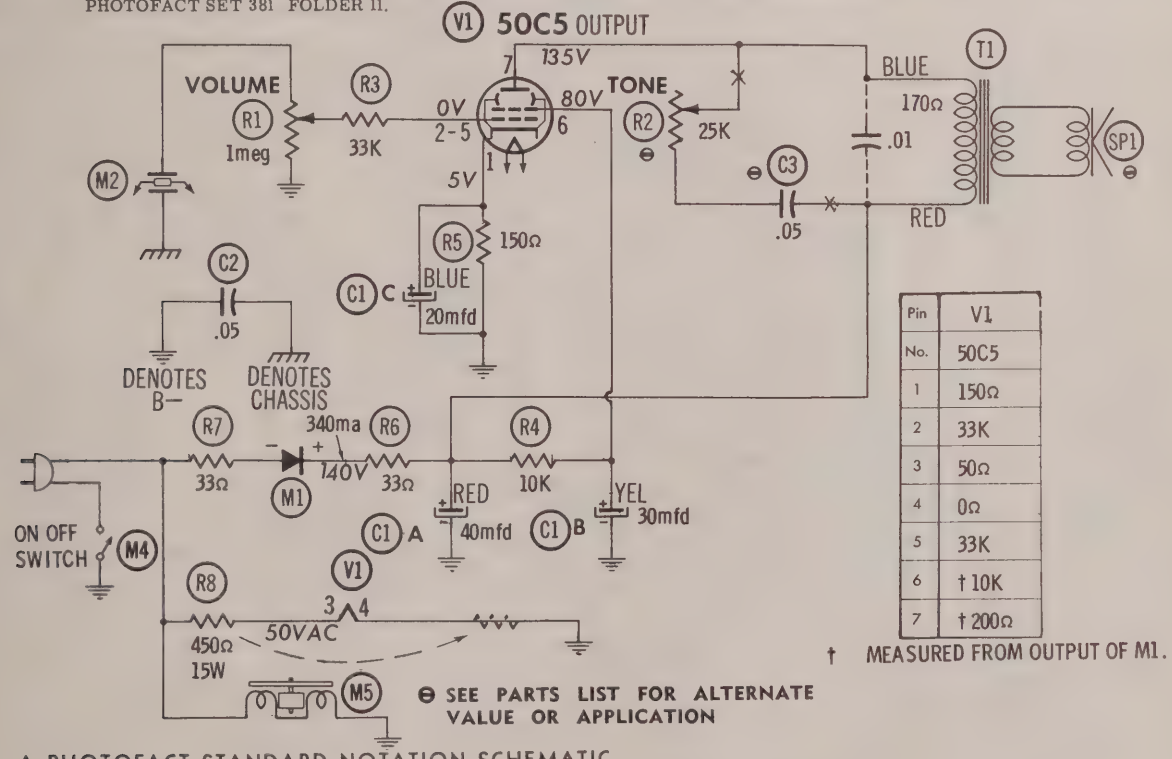
TRAV-LER
MODELS 8035, 8040

TRAV-LER
MODELS 8035, 8040

MODEL 8040

TRADE NAME	Trav-Ler Models 8035, 8040
MANUFACTURER	Trav-Ler Radio & Tel Corp., 571 W. Jackson Blvd., Chicago, Illinois
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (One)	Type 50C5 Output
POWER SUPPLY	110-125 Volts AC-60 Cycles RATING .25 Amp. @ 117 Volts AC (23 Watts)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #RC-29--SEE SIMILAR MONARCH UA8--
PHOTOFACT SET 381 FOLDER 11.



Pin No.	V1 50C5
1	150Ω
2	33K
3	50Ω
4	0Ω
5	33K
6	† 10K
7	† 200Ω

† MEASURED FROM OUTPUT OF M1.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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H676

SET 424 FOLDER 13

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	50C5	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	TRAV-LER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	EC-71	PRS150V403020	BBR43215		TDLT-3	FMT-312	R2705 *
B	30	150							
C	20	150							

* Not normally in distributors stock. Available thru distributor on order from manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	TRAV-LER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	400	PC-5	P288N-05	DF-503	CUB4S5	GEM-415	4TM-S5	
C3	.05	400	PC-5	P288N-05	DF-503	CUB4S5	GEM-415	4TM-S5	Note 1

Note 1. Model 8035 uses .01mfd in this application (Part #PC-7).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRAV-LER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	VC-118	B-70	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	25K	½	VC-71	B-26	A47-25K-S	Q11-120	U29	Tone Note 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

Note 1. Tone control not used in Model 8035.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		TRAV-LER PART No.	NOTES
	OHMS	WATT		
R3	33K		IR-180	
R4	10K		IR-37	
R5	150Ω		IR-14	

ITEM No.	RATING		TRAV-LER PART No.	NOTES
	OHMS	WATT		
R6	33Ω		IR-17	
R7	33Ω		IR-17	
R8	450Ω	15(WW)	WR-25	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2450Ω	3-4Ω	Part of SP1	Z1101	A-3025	AU-605	A-3332	24S53	S-12X	

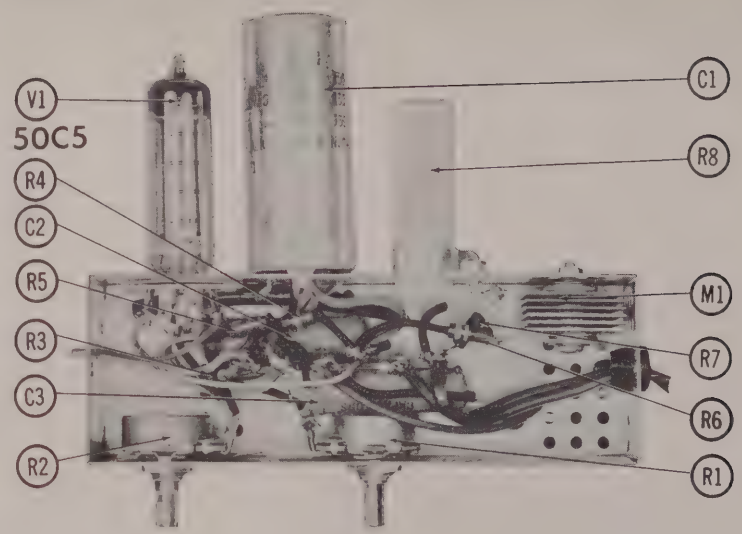
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRAV-LER PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	SPK-22	4A07	① Alternate Part #SPK-23A

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	TRAV-LER PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.034A	SR-3	1234AH	65	65 M150①	① Silicon Type

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	TRAV-LER PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2		420-TS	N8-1 and N8-3			

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	TRAV-LER PART No.	JENSEN PART No.	WALCO PART No.	
M3	(78)	† CRA-55 or ♦ CRA-55D	† W-64S or ♦ W-64D	† Jewel ♦ Diamond
	(LP)	† CRA-55LP or ♦ CRA-55LPD	† W-64MGS or ♦ W-64MGD	

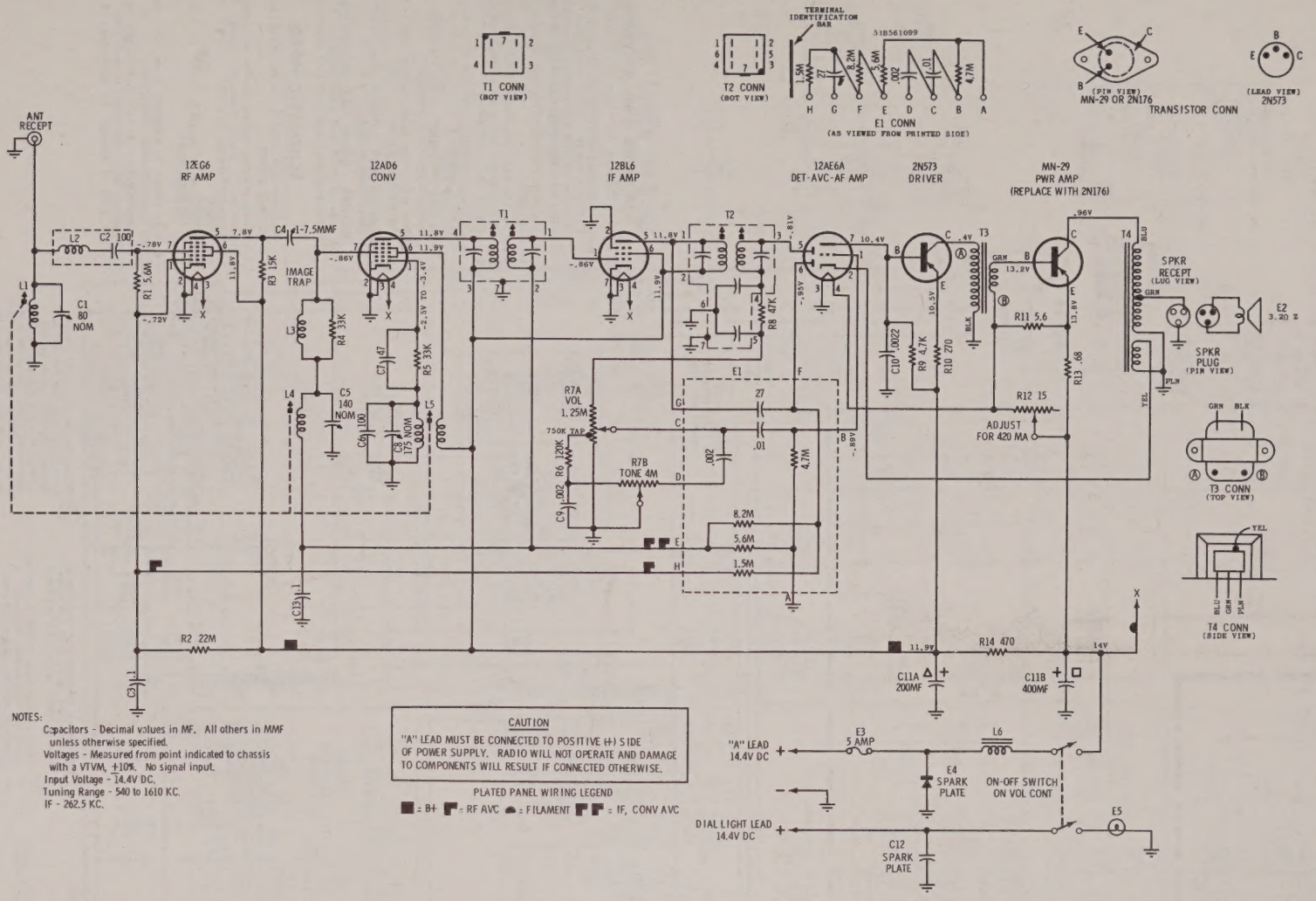
MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
M4	Switch		Part of Phono Ass'y. (Part #RC-29)
M5	Motor		Part of Phono Ass'y. (Part #RC-29)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

FORD MODELS 94MF (B9FA-18806-C), 94MFM (B9FA-18805-E)



NOTES:
Capacitors - Decimal values in MF. All others in MMF unless otherwise specified.
Voltages - Measured from point indicated to chassis with a VTVM, ±10%. No signal input.
Input Voltage - 14.4V DC.
Tuning Range - 540 to 1610 KC.
IF - 262.5 KC.

CAUTION
"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.

PLATED PANEL WIRING LEGEND
■ = B+ ■ = RF AVC ◠ = FILAMENT ■■ = IF, CONV AVC

Schematic Diagram Courtesy of Motorola, Inc.

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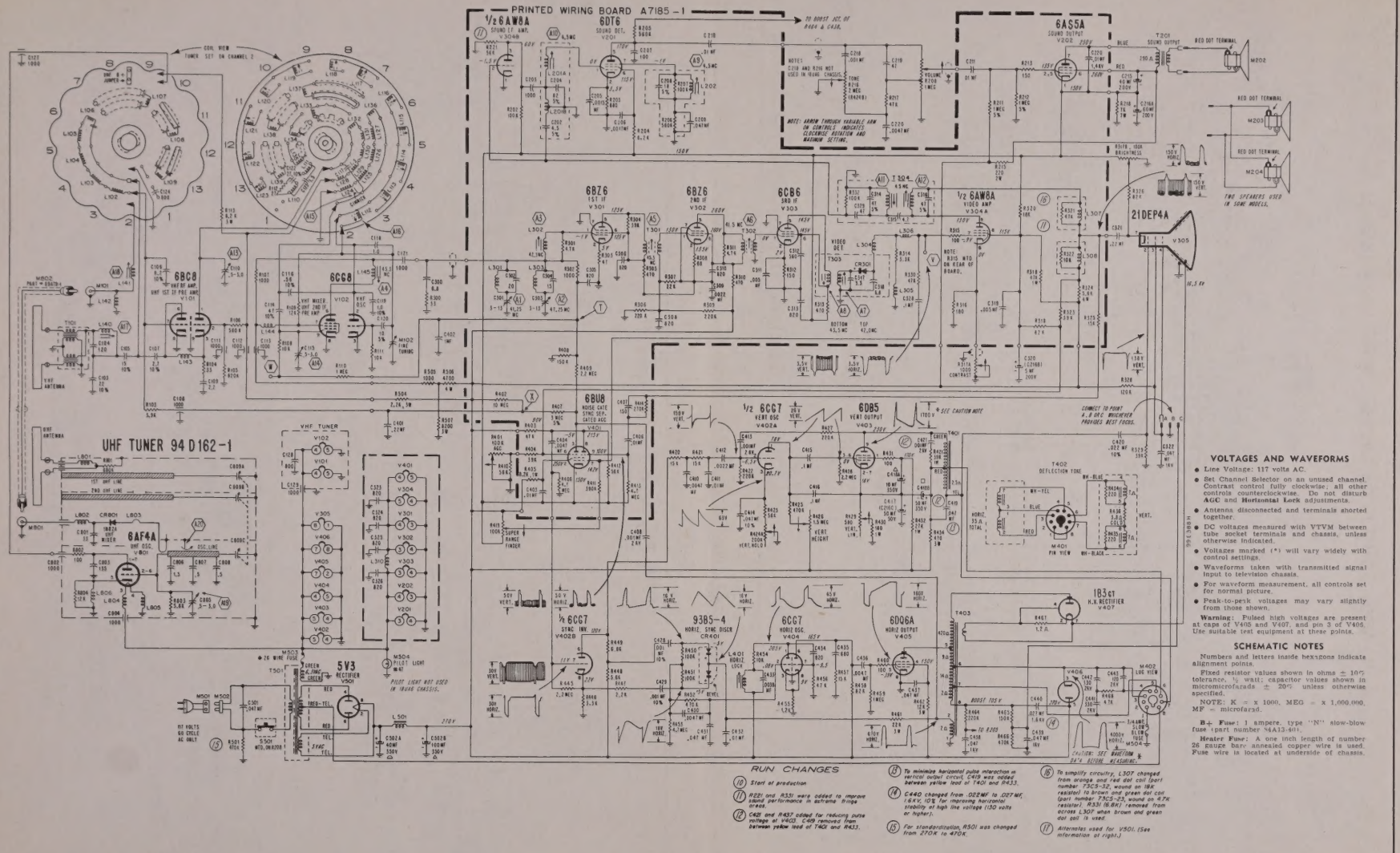
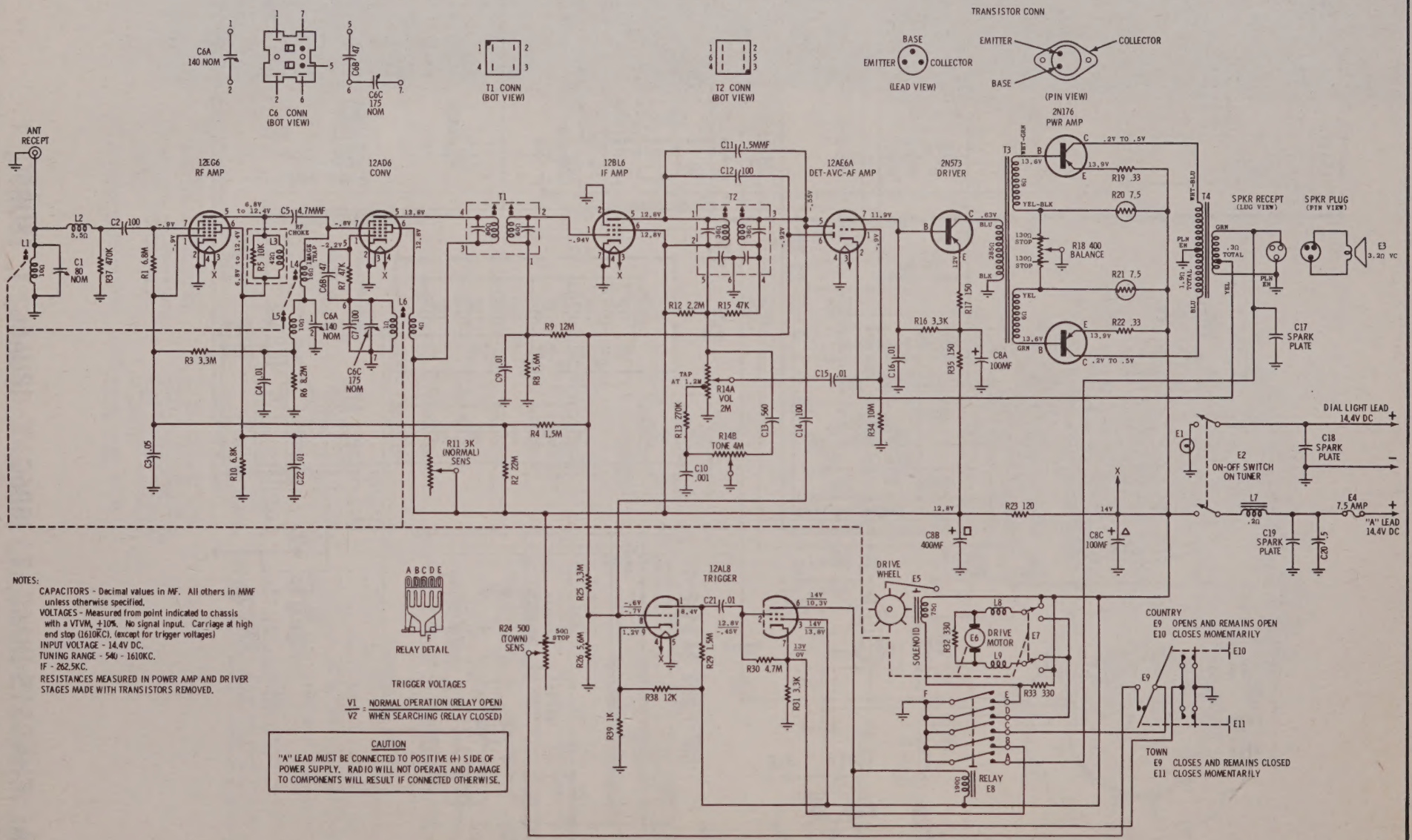

PRINTED WIRING BOARD A7185-1
UHF TUNER 94 D162-1
VOLTAGES AND WAVEFORMS
Line Voltage: 117 volts AC.
Set Channel Selector on an unused channel. Contrast control fully clockwise; all other controls counterclockwise. Do not disturb AGC and Horizontal Lock adjustments.
Antenna disconnected and terminals shorted together.
DC voltages measured with VTVM between tube socket terminals and chassis, unless otherwise indicated.
Voltages marked (*) will vary widely with control settings.
Waveforms taken with transmitted signal input to television chassis.
For waveform measurement, all controls set for normal picture.
Peak-to-peak voltages may vary slightly from those shown.
Warning: Pulsed high voltages are present at caps of V405 and V407, and pin 3 of V405. Use suitable test equipment at these points.
SCHEMATIC NOTES
Numbers and letters inside hexagons indicate alignment points.
Fixed resistor values shown in ohms ± 10% tolerance, ½ watt; capacitor values shown in micromicrofarads ± 20% unless otherwise specified.
NOTE: K = x 1000, MEG = x 1,000,000, MF = microfarad.
B+ Fuse: 1 ampere, type "N" slow-blow fuse (part number 84A13-401).
Heater Fuse: A one inch length of number 26 gauze bare annealed copper wire is used. Fuse wire is located at underside of chassis.
RUN CHANGES
(10) Start of production
(11) R221 and R531 were added to improve sound performance in extreme fringe areas.
(12) C429 and R437 added for reducing pulse voltage at V403. C419 removed from between yellow lead of T401 and R433.
(13) To minimize horizontal pulse interaction in vertical output circuit, C419 was added between yellow lead of T401 and R433.
(14) C440 changed from .022MF to .027MF, 1.6KV, 10% for improving horizontal stability at high line voltage (130 volts or higher).
(15) For standardization, R501 was changed from 270K to 470K.
(16) To simplify circuitry, L307 changed from orange and red dot coil (part number 73C5-32, wound on 18K resistor) to brown and green dot coil (part number 73C5-23, wound on 47K resistor). R331 (6.8K) removed from across L307 when brown and green dot coil is used.
(17) Alternates used for V501. (See information at right.)
ADMIRAL CHASSIS 18A6C, T, 18B6C, T, 18UA6C, T, 18UB6C, T
Schematic Diagram Courtesy of Admiral Corp.

FORD MODEL 95MF (B9FA-18806-B)



NOTES:

CAPACITORS - Decimal values in MF. All others in MMF unless otherwise specified.

VOLTAGES - Measured from point indicated to chassis with a VTVM, ±10%. No signal input. Carriage at high end stop (1610KC). (except for trigger voltages)

INPUT VOLTAGE - 14.4V DC.

TUNING RANGE - 540 - 1610KC.

IF - 262.5KC.

RESISTANCES MEASURED IN POWER AMP AND DRIVER STAGES MADE WITH TRANSISTORS REMOVED.

TRIGGER VOLTAGES

V1 - NORMAL OPERATION (RELAY OPEN)

V2 - WHEN SEARCHING (RELAY CLOSED)

CAUTION

"A" LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY. RADIO WILL NOT OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.

Schematic Diagram Courtesy of Motorola, Inc.